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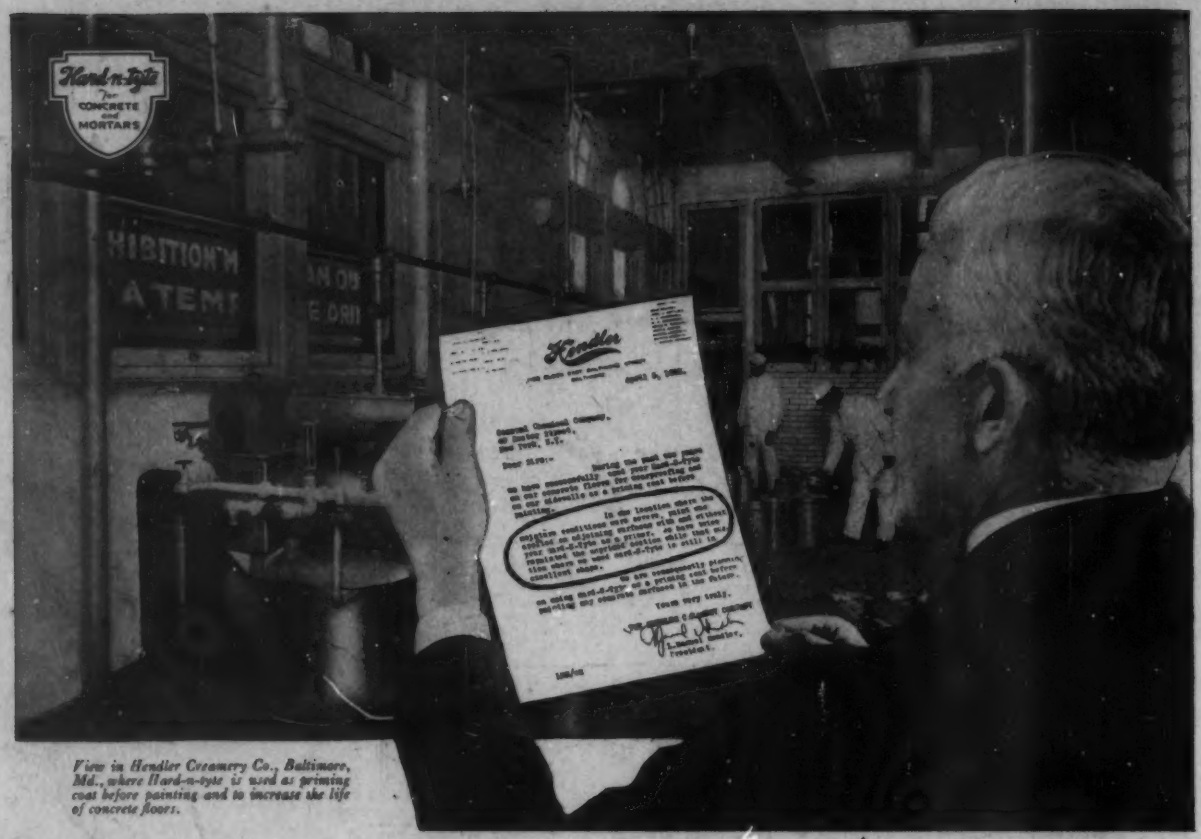

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THE ARCHITECTURAL FORUM

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ALBERT J. MacDONALD, Editor

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THE EDITOR'S FORUM

THE AMERICAN CONSTRUCTION COUNCIL

IT will be recalled that in the period immediately following the war the American Institute of Architects through its Post-War Committee expended effort and money in giving serious study to the organization and production of the building industry, particularly from the viewpoint of the architect. A firm conviction was reached that more constructive co-operation among the various elements of the industry was necessary to successful functioning, and the first definite step toward this goal was a conference called by the Institute at Atlantic City in September, 1920, to which were invited representatives of all interests and agencies associated with building. The result was the organization of the National Congress of the Building and Construction Industry.

The Congress involved a new conception of organization; it was not to operate for the economic benefit of any one element of the industry, but was to be an organ of service to all, giving advice following impartial study of actual conditions that would tend to eliminate friction and weld together an industry that would consider first its obligation of service to the public. Extensive publicity and large appropriations for development the Congress has not had, yet its work has gone forward and active local groups are functioning in Boston, New York and Philadelphia, and in the states of Washington and Oregon.

This new conception of organization has not passed unnoticed. Recently a movement of similar intent has been discussed in a larger and national way and has now crystallized in the American Construction Council which was organized in Washington on June 19, at a meeting conducted by the Secretary of Commerce, Herbert Hoover. Its expressed intention is to place the construction industry on a high plane of integrity and efficiency and to correlate the efforts towards betterment made by existing organizations by means of a conference association representative of the whole industry.

The organization thus parallels the National Congress of the Building Industry in its idea, and it is probable that the functions of the Congress will be absorbed by the Council if its progress is in keeping with its adopted bylaws and the general spirit of disinterested study and co-operation under which it starts.

The American Institute of Architects at its recent convention voted to become an association member of the Council and stands ready to aid in every possible way the fulfillment of the Council's desires. It merits this co-operation and approval of the Institute because its bylaws recognize the essentials of practice the Institute deems important to the success of such a body. Briefly these points are: The organization should include all the elements in the industry; it should be essentially a conference organization; its relation to its various members should be purely advisory; it should recognize the local nature of many of the industry's problems and foster local organizations of similar character and co-ordinate their activities.

The Council is unique among the many organizations that have arisen within the building industry in that it has no disciplinary powers and invites both labor and capital interests into its conferences. A very significant stand was taken by building trades labor when the Building Trades Department of the American Federation of Labor indorsed the Council and unanimously voted to affiliate with it at their recent convention.

The Council should not be the type of organization that succeeds on publicity alone; it is constituted to study the building industry from within in a scientific manner; its progress therefore must be slow, and the public and the various parts of the industry must be careful not to embarrass it by expecting and demanding superhuman results in a brief space of time. Some of the work that has been agreed upon as desirable of accomplishment and on which study and research will be expended are: a code of ethics; adequate statistics; apprenticeship systems; legislation along vocational lines; a uniform building code; standard railroad rates; seasonal employment; standardization and elimination of waste in building, and other subjects of similar constructive character.

The Council is composed of these groups, each with equal voting power: architects; engineers; construction labor; general contractors; sub-contractors; material and equipment manufacturers; material and equipment dealers; bond, insurance and real estate interests; construction departments of public utilities, and the construction departments of federal, state and municipal governments. The voting membership is confined to associations, although individuals and firms interested in construction may become sustaining members with the privilege of the floor at all meetings.

Such a body with direct representation of every function of the building industry has great possibilities for doing a vast amount of good in behalf of building. The absence of any element of compulsion places it on a high plane of idealism, yet its scheme of organization insures a practical foundation for its efforts. If the support of the industry is given the movement, there has come into existence an opportunity to achieve self-government in the building field and thus make unnecessary governmental regulation that would some day be demanded by a public that has sickened of the many controversies and lack of co-ordination so evident in the past. Franklin D. Roosevelt was elected president of the new Council.

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TEA HOUSE IN THE GARDEN OF A MANDARIN'S VILLA, HANGCHOW

Situated in the middle of a shallow lotus pool, on a meandering stone bridge, this structure of three columns and triangular roof reflects its gay color among the green pads.

Photographed by Edwin L. Howard

The
ARCHITECTURAL
FORUM

VOLUME XXXVII JULY 1922 NUMBER 1

American Institute of Architects' Convention

CHICAGO, JUNE 7, 8 AND 9, 1922

IF at any time architects of the country entertained the thought that the American Institute of Architects was of greater value to eastern than to western men and was conducted with their interests primarily in view, surely the events connected with the 55th convention served to change any such feeling. The sessions of the convention were held in Chicago, and the traditional magnanimous and progressive spirit of the middle west was noted in the hospitality of the Chicago chapter and architects. Then again, the new president of the Institute is William B. Faville of San Francisco, who has the distinction of being the first architect from the Pacific coast to fill the chair of president. The Institute may feel equally honored, because the brilliant and constantly expanding group of architects on the Pacific coast is an active force in the development of architecture in this country, and the direct representation of these men in the councils of the Institute will encourage a broad, constructive policy in Institute affairs if the character of the work they have been doing in recent years is a criterion.

This turn of events in the Institute is but another indication of the wonderful manner in which we are welding together the citizens of this huge country of ours. When the exponents of an art so personal as architecture can come together from points 3,000 and more miles apart, representing different tastes due to widely different climatic conditions, racial extractions and cultural influences, and find common interest in ideals for public service, ethics of practice, and the maintenance of local architectural precedents, we have an exceptional example of the benefits derived from association and the tolerance and good will that emanate from knowledge of the other man's personality and work.

If there were nothing to record in the way of actual accomplishments of the convention as a body, an observant spectator would be compelled to admit that the annual gathering of chapter delegates and individual architects from all sections of the country means much for American architecture. Men come direct from the active problems of practice with ideas that are bred of local conditions uppermost; the few days of the convention, spent in the atmosphere of recreation and social contact, make possible a broader view of architecture and its relation to the affairs of the world than is possible in an office, and frequently the criticisms and objections that seemed so important at the start fall into proper perspective. The opportunity to participate in the convention sessions is open to all and acts as a safety valve; aside from this there are numerous occasions when groups of two or more architects can quietly gather to relate experiences and express hopes and ideals that are of the greatest interest and value.

In conventions of the past action of importance has occurred, and conventions of the future may stand out as milestones in the development of the profession; the Chicago convention at this time cannot be singled out as one of great importance because of any definite policies formulated or other direct action taken, but it is our impression that as a meeting of architects it was unusually successful and will be recalled in later years not alone for the pleasant circumstances, due to the choice of Chicago as the convention city, but for the influence it will exert on the work of the profession of the next and succeeding years. It is the first occasion for a number of years when architects could gather and honestly express a feeling of buoyant optimism for the immediate future of architecture and building generally, and this was of the greatest psychological value. This feeling of confidence was evident everywhere; there was no tendency, as in conventions of recent years, to complain about lack of appreciation for architecture by the public, or that utilitarian consideration has become so important that the engineer is to suffice in the direction of building enterprises. The profession of architecture is moving with steady pace toward the opportunity for which it has long waited, and one observing the convention could not fail to realize it.

Many of the delegates arrived early because of a pre-convention meeting, related to advertising, which developed a valuable point of contact between architects and manufacturers that holds promise of mutual benefit if the resolution passed by the convention, suggesting a permanent organization through a Producers' Section of the Insti-

tute, is put into effect. The Chicago architects were on hand to meet arriving guests, and an informal smoker held the evening before the convention began provided a foretaste of Chicago hospitality and promoted general acquaintance that was invaluable in creating a spirit of cordiality that continued through the three following days, culminating in the closing banquet that will be recorded as one of the most successful and enjoyable Institute affairs ever held.

The convention sessions were held at the Chicago Beach Hotel, several miles from the center of Chicago and adjoining Jackson Park and the site of the Columbian Exposition. It was a fortunate experiment and reacted to the benefit of the convention in making possible a much higher average of attendance than is usual, and was enjoyed by the delegates for the better opportunity provided for informal gatherings.

The Institute is to be warmly congratulated on its growth, the progress noted in President Kendall's opening address giving indication that within a few years the membership will be such that there can be no question of the Institute's representing in numbers the great majority of the architects of the country. There is now a total of 51 chapters, 12 of which have been formed in the last two years. The increase in membership in these two years is 1,032, making a total membership of 2,500 in round numbers. This is remarkable in the light of the depressing conditions that have surrounded architects during this period and is evidence enough of the new spirit of service and pride of accomplishment that have arisen within the Institute. It is the result of the very earnest work of chapters throughout the country, and this together with the healthy financial condition of the treasury should be a source of great gratification to the retiring president, Henry H. Kendall of Boston. Mr. Kendall enjoyed the most enthusiastic support of the officers and members during his term, and his genial personality, excellent presiding powers, ever-present good nature and his tact and resourcefulness in keeping discussion from entering troubled waters will long be remembered.

The Institute's progress has been turned over to able hands in Mr. Faville, and he carries with him into office the high regard and affection of architects in the east no less than he does of his own immediate confrères of the Pacific coast. The other officers elected are Ernest J. Russell, St. Louis, first vice-president; Robert D. Kohn, New York, second vice-president; William Stanley Parker, Boston, secretary, and D. Everett Waid, New York, treasurer. Three directors were also elected: William Emerson, Boston; Benjamin W. Morris, New York, and William L. Steele, Sioux City, Iowa. Herbert Hoover, Secretary of Commerce, was elected an honorary member, the Institute thus giving recognition to the noteworthy work Mr. Hoover has done for the building industry and the public and to his generous acknowledgment of the services of architects in matters of economic import connected with the building industry.

At the convention of last year the gift to the Institute of a fund for educational purposes was announced. The donor desired to remain anonymous, but it was a pleasure to the members to hear President Kendall recommend that the fund be named the Waid Educational Endowment Fund in honor of its donor, D. Everett Waid. The fund amounts to $28,000, and it is hoped that it will prove the nucleus of resources for the training of promising young men who enter the profession.

Two matters on which affirmative action was taken may appear simple and of but passing interest, yet they may have wide effect on the Institute's future. The first relates to principles governing practice and is indicative of the growing tendency to depend less on a rigid code of ethics and to trust more to the individual's own sense of right as a guide. Canon 11 of the Code of Ethics, which has declared that it is unprofessional "to compete knowingly with a fellow architect for employment on the basis of professional charges," was intended of course to prevent one architect's quoting a lower fee than another for the purpose of securing a commission. With the growth of methods other than the percentage basis for determining fees and in view of the procedure of reducing by fairly common consent the rate of percentage on certain types of building, such as office buildings, lofts and factories, the practical application of the Canon has involved great difficulties.

The convention voted, therefore, to remove this Canon from the Code and to substitute for it this addition to paragraph 4, "On the Architect's Charges" of the Circular of Advice:

"To compete knowingly with a fellow architect for employment on a basis of professional charges is inconsistent with the spirit of this Code."

An amplification of this statement to the effect that an architect should take reasonable steps to ascertain if other architects were under consideration by the client, and that in no event should he depart from any special standard of charges for the purpose of underbidding some competitor, was a part of the original resolution. This was removed from the resolution before it was passed, but is referred to here to indicate the spirit in which the change was made. The principle is now entirely clear, and its application is left to the determination of the individual according to his own conception of correct practice.

The second matter relates to Institute membership. By action of the convention and on the recommendation of the Committee on Survey of Institute Methods, a new class of membership, open to recent graduates of qualified architectural schools, was created. This is a membership at large, the men in this class not being affiliated with any chapter; all graduates and such special students as have certificates evidencing satisfactory completion of studies from their dean or faculty are

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AMERICAN INSTITUTE OF ARCHITECTS BANQUET
OLD FINE ARTS BUILDING, CHICAGO, JUNE 9, 1922

The setting under the dome of C. B. Atwood's Fine Arts Building of the Columbian Exposition was distinctly architectural and served to focus attention of both architects and public on the efforts of the Illinois chapter to restore this excellent example of classic architecture for the edification and use of the public. The rotunda was beautifully arranged as a garden under the direction of Paul Chalfin. The lofty interior glowed with rose light reflected from the dome, and the approach to it from the portico under moonlight through the dark colonnaded lobby presented a picture that will remain long in the memories of the guests.

eligible to membership within a period of two years from graduation or completion of their courses. The membership is designated as Junior Membership with the affix, "Junior American Institute of Architects." The privilege of such membership expires automatically when the member reaches the age of 30, by which time it is assumed he will have been affiliated with a chapter and have secured full membership. The annual dues for junior membership have been placed at $5, so that no financial burden is involved. This interest of the Institute in the annual output of the schools from which the architects of the future are recruited is to be highly commended. It will be of value to the young man in bringing to his attention early in his career the Institute standards and will likewise provide a boon for the Institute in that the enthusiasm, ideals and optimism of youth will be available in carrying on the organized activities of the architectural profession.

Only two subjects brought out extended discussion because of differences of opinion. The work of the Small House Service Bureau, which is under Institute guidance and provides service at low cost in the design of small houses for those people who would ordinarily not be able to have architectural advice, is questioned in some sections because of alleged discrepancies between the method of organization and recognized local legal procedure for the practice of architecture; in some other sections enthusiasm for the idea is lacking because of a feeling that the plan interferes with the activities of younger architects who are dependent on this type of work for their living. The Bureau has been operating long enough to prove the need for its services, and in those sections where activity has been the greatest the contention that it supplants regularly practicing architects has not been borne out. In response to suggestions from Illinois it was voted as the sense of the meeting that it would be desirable to identify each plan by the name of its designer, instead of following the present practice, representing it as the joint work of the members comprising the Bureau.

The subject of Jurisdictional Awards and the policy of the Institute in being an active party with the American Federation of Labor in the adjudication of such disputes brought out a general discussion following the presentation of the report of the Institute's committee charged with the details of the work. The discussion was interesting as an indication of the way in which local opinion changes as conditions change; there was a direct reflection of the feeling in different cities on the closed *vs.* open shop question, and a reflection of an evident failure on the part of those criticising the Board of Awards to recognize that their present fortunate conditions in which the control of building operations has been wrested from organized labor is of but recent origin and that they hold no guarantees for maintaining their position through a period of building prosperity when the old law of supply and demand is known to upset the most carefully laid plans. We hold no brief for the closed shop, but it is our opinion that a factor of such importance as the Jurisdiction Board, which offers a positive means of alleviating evils in communities where conditions have the possibilities of being the worst, should not be overthrown because temporary and localized advantages arise. The difference of opinion really arises through misunderstanding of the application of the plan. Since jurisdictional disputes can only occur in communities where building conditions are governed by organized labor rules, the awards of the board can apply only in unionized territories. Open shop and American plan communities do not recognize labor's claim to make rules, and accordingly any adjudication of counter union claims cannot even be applied in principle. Those architects working under conditions other than those laid down by labor should be satisfied to count themselves fortunate and be happy to give countenance to any method or rulings that will alleviate conditions in localities not so fortunately placed. This and a few other minor points on which discussion developed were passed over without inconsiderate action being taken, the opposition in each instance being satisfied to conclude the issue with its dissenting opinion placed on the convention record for the board's consideration.

With a note regarding the approval of the Institute in the aims of the American Construction Council, which is a new national body organized along lines held essential to success by the Institute, and the unanimous vote of the convention directing the Institute to become an Association Member of the Council, the points of chief importance have been related.

In arranging the convention program effort was made to find more time for the consideration of matters bearing particularly on the phases of architecture as an art, in response to suggestions made at previous conventions that the inevitable business routine be relegated as far as possible to the board of directors. Much of the more or less rambling discussion recalled in previous conventions was eliminated by the simple expedient of establishing a resolutions committee which effectually disposed of well intentioned but frequently extraneous suggestions.

The provision for group lunches with scheduled speakers for each day was a pleasing innovation, and the talks were well varied with wit, art and business. In reviewing the convention, some of the Chicago architects regretted that all of the speakers were Chicago men, but this we are sure arises from architects' proverbial sense of modesty. The delegates came to Chicago to appreciate its progressiveness and to hear from its leaders in the profession. The Chicago architects are not accused of thinking that all art and practical considerations of architecture derive their leadership from the Lakeside City, although they have many admirers who would gladly claim this position for them.

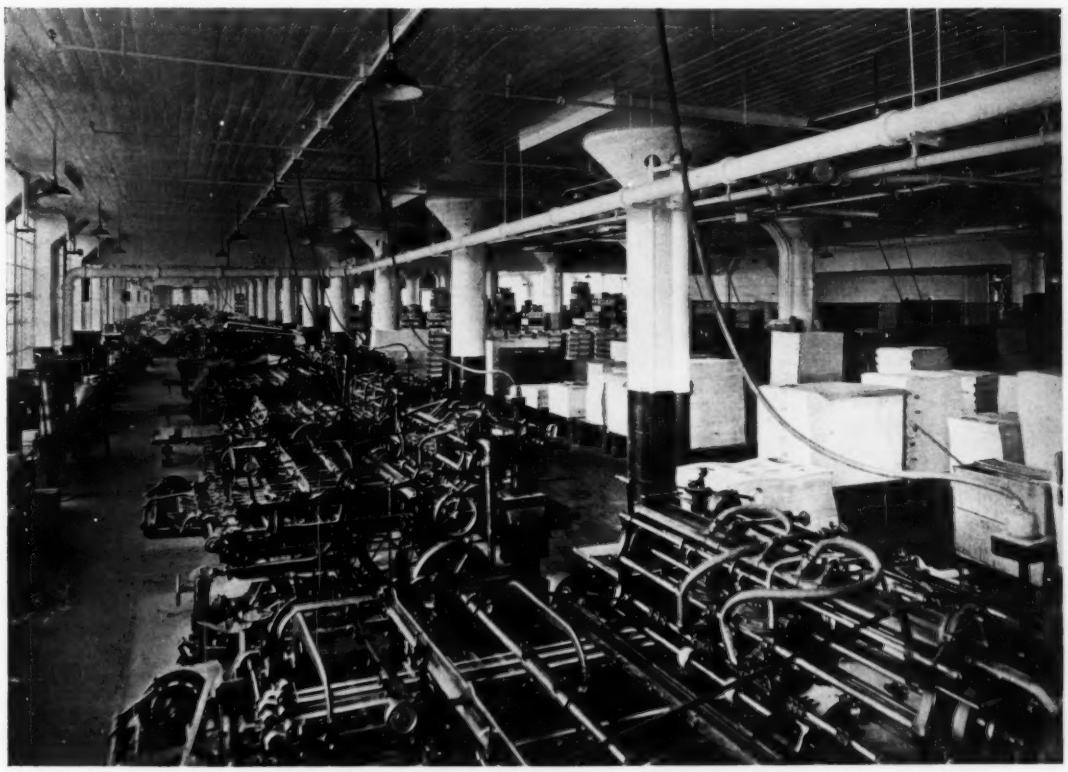
The Modern Publishing and Printing Building

By GEORGE NORDHAM, A.I.A.

IMPROVEMENT in the design, construction and equipment which recent years have brought in business structures of every kind is particularly marked in buildings devoted to manufacturing purposes, and in no part of this broad field is the improvement more marked than in structures intended for printing establishments. The day has passed when an architect's duty was performed when he had provided four walls and a roof as a shelter for equipment which fulfilled every utilitarian function, all this given an aspect in which architectural appearance counted for naught. The larger and more important the modern printery the more certain is it to be planned and built with an eye to its appearance and to the comfort and contentment of those who work therein. Equally important, however, is its practical function, and an effort is made here to outline the best possible design, lay-out of plans, materials, construction and other details of a structure for the carrying on of a publishing or printing establishment.

The essential requirements of a modern publishing house are economy of operation in the handling of materials and freedom from fire hazard. It should also present an appearance of dignity and be generally suitable for an industry which possesses noble traditions and is closely allied to the liberal arts. The size of the appropriation for building naturally affects the result, and there are other considerations such as location, size and arrangement which will give the highest degree of efficiency, lowest cost of maintenance, greatest safety for employes and freedom from interruption of business, best light, ventilation and sanitary conditions, all of which must receive careful study. There should be kept constantly in mind:

1. Processes of publication, machinery, apparatus, etc.
2. Kinds and quantities of material used in raw and finished products.
3. Number of people employed in the plant, and their accommodation.
4. A carefully studied and logical arrangement of various departments and machines, so that material during manufacture is handled a minimum number of times.
5. Consideration of a possible future extension to the building and planning so that in case of



View in Pressroom of Metropolitan Printing Plant, Long Island City, N. Y.
D. Everett Waid, Architect

Machines in the Bindery of the Metropolitan Plant Are in the Outer Bay with Center Space for Storage

such building it will not be necessary to move machinery or to interrupt business.

Location and Type of Building. In the selection of the site several important items should be considered: the healthfulness, light, railroad facilities which involve the receiving of paper and other printing materials, coal, the mailing of magazines, express, telegraph and telephone facilities, etc. Locations that are remote and inaccessible are inadvisable because difficult for customers and employes to reach.

Of all kinds of buildings, the ideal plant, from the standpoint of operation, is probably the one-story building, its area being as large and well lighted as possible. The method of operation in this type of building may be considered as direct, that is the raw product (the paper) would come in at one side of the building and the finished product (books, magazines, etc.) would be shipped away at the other. The general rule might be that buildings of large area and few stories are more desirable than tall buildings small in area. The building should be as nearly fireproof as possible. There are always large quantities of paper, oil, etc., in the structure, and a fair percentage of the increased cost may be met by the lower insurance rate if the building is as nearly fireproof as possible. Brick or tile partitions should naturally be used in preference to partitions of wood.

The most important consideration, however, in the ultimate success of the plant is the plan layout, which will locate the machinery in such a way as to best suit the particular case.

The Material of the Structure. The material selected must be chosen with several considerations in view. It would be absurd to say that, for example, a brick and steel structure is the best for all cases. The size in area and height, financial limitations, etc., are really controlling factors, but whatever be the amount of the appropriation the result must be the best and most suitable building which can be had. For one-, two- or three-story buildings, mill construction of the slow-burning type is often desirable and it is comparatively inexpensive. For a building up to six stories reinforced concrete is as good; it is fireproof and more bulky and is, therefore, a good shock absorber. Good structural designing may even consider a concrete building up to eight stories in height, but the columns become so large and closely spaced in the lower stories of such a building that this type is less desirable than some others.

For a tall building, brick and steel construction is probably best as the frame ties the building together and columns may be placed farther apart and be smaller in size. Possibly a composite structure—that is one built incorporating various materials in different acceptable parts—would be the proper solution.

Plan and Arrangement. As an approximate guide this method of floor arrangement, departments and their sub-departments is suggested, the sizes of all rooms and parts being left to the architect to determine according to the needs of his particular client and the amount of space at his disposal.

The basement should contain boiler rooms, engine room for dynamos, pumps, etc., a waste paper room with baling apparatus, a stock room with shelves, thoroughly dry storage rooms for paper, a general storage room and a plate vault to store plates for future use. There are cases where it is desirable to plan a separate building for a power-house where the area of the plant permits.

The first story should contain entrances and elevator lobbies, and a large general locker room divided for men and women for all departments, with watchmen and watchwomen on continuous duty. Between the entrance lobby and general locker room should be a time clock for the recording of entry and exit of employes. The employes' entrance should be apart from the customers' entrance. Adjoining locker rooms, men's and women's

toilets, receiving, shipping and mailing departments should be installed. A receiving department should be at one end of the building and a shipping department at the other end if possible, but both may be confined to one space if the building is small in area. The planning of the receiving and shipping departments will depend in a large measure on the transportation facilities which will be chiefly employed. Where railroad service is to be used the building must be planned with reference to switching facilities, and if the plant be sufficiently large there may even be several switches into the building which would of course greatly simplify the receiving and shipping problems. Care should be taken not to interfere with the different directions of traffic, and floor levels should be arranged so that wagons can back up to a platform, level with floor of wagon and main floor, the driveway being pitched to accomplish this if necessary. Stock clerks' rooms in receiving and shipping department will be necessary. Provide at receiving and shipping departments a lowerator and dumb-waiter to basement. Ramps should be provided whenever floors are on different levels. If the building is for a newspaper or a general publishing firm, necessary offices or salesrooms should be placed on the ground floor for public convenience.

A mailing department should be placed as near the shipping department as possible. This is particularly necessary in cases where shipping is done by mail as well as by freight or express. In case the building is intended for the use of newspaper publishers and much of the shipping done by fast mail, the mailing room should connect with the platforms which hold the automatic "mail arms" from which mail bags are gathered by trains running at full speed.

Location of Pressrooms. The pressroom floors should be as near to the ground as possible to reduce vibration. In this department there should be the various presses, plate and roller rooms. If the ceiling is high a smaller room with a mezzanine for these may be considered. Men's toilets with a spy window for foremen to prevent loafing should be near the pressroom and sometimes women's toilets, as women are at times employed to take sheets from delivery of presses. Supply room and foreman's office should be in conspicuous locations. Some publishers might prefer to have the pressroom in the basement, in which case it may be surrounded by daylight; this would also eliminate vibration and lower the live load of the upper floor upon which it would otherwise be located. An ink room should be provided with an ink grinder, and include shelves for storage of cans of ink.

Arrangement of Office. The office division should be placed where the employes may benefit by the light, preferably on upper floors of the building, and may include various private offices, general offices and public spaces. There will also be offices

Shipping Platform of Metropolitan Printing Plant, Long Island City, N. Y.
Note separate entrances to individual tenants' shipping rooms

for cashier, various editors, a vault for valuables, rooms for advertising manager, business manager, general manager and foreign department, a filing room with a table, photographic room with dark room, art editor's and illustrating studios, sample room, subscription department, stenographers' rooms, bookkeeping department, etc. Provide also for a general conference or reception room.

If general locker rooms are undesirable on first story, enough individual lockers should be placed in each department. Each department should have a stock room if necessary, placed centrally but not occupying valuable daylight space. Luncheon facilities serve to keep employes contented. Time is saved and employes may be able to secure food at lower prices than at outside restaurants, and the revenue from this department, if properly managed, may interest the concern. Reading and recreation rooms are also desirable, and should be separate for men and women. The machinists', electricians' and carpenters' rooms are sometimes located in the basement, but this is not to be considered as the best practice as they should be located more centrally in the building for immediate call and should have plenty of daylight. A general medical aid room should be provided, and it should be complete with first aid kits, physician's sink, cabinets, etc. It should be partitioned off for men and women, with several beds in each room. Sometimes there should be a room for the nurse or matron, and in the larger establishments examining and operating tables are provided. A medicine closet with first aid kit should be set in each foreman's office.

The press department being nearest to the source of incoming paper, the remaining departments might adjoin in the order listed: make-up rooms, composing room, folding department, bindery, mailing department, foundry and photo-engraving room.

Vibration. This is the arch-enemy of printing buildings. A printing house should be as free from vibration as possible and a solid building, standing well under heavy shocking strain, makes the best solid foundation for machinery, while a building massive in character and construction serves as the most efficient steadier and stiffener possible. Vibration in the building slows down the machinery and throws it into "tune" which will ultimately rack the machinery apart. When the machinery stands on a solid foundation; viz., substantial building, the machinery may be speeded up, thereby giving a greater output to the plant.

If photographic work is done in the plant it should be remembered that time exposures can only be made in a steady building, and practically all photographic work done in the building is time work.

The Spacing of Columns. By spacing of columns to permit the best machinery layout the efficiency of the building is increased. There is considerable difference of opinion in regard to the ideal spacing of columns. Undoubtedly the size of the plot or building really controls this subject, but there are certain good principles it would be advisable to follow. The spacing of the presses in a large measure determines the spacing of the columns. They should be spaced mainly with the consideration of placing presses in width between columns rather than considering the length of the press between columns. The main operation of the press by the men is on the side, and they will have to get from one end of the press to the other to keep account of all the different parts.

When one press is placed in a bay, with truck passageway alongside of press, columns may be spaced from 15 to 17 feet on center if convenient. If two presses are placed in a bay without truck passageway, columns may be spaced from 20 to 25 feet on center. It need hardly be said that in placing the presses full regard must be paid to the sources of natural and artificial light. The plan should make possible the full utilization of every source of light.

Floor Loads. A suggestion for the live loads is given: the pressroom floors from 300 to 400 pounds per square foot; due allowance should be made for the storage of paper to supply the presses as soon as the press is ready, and this is included in these figures; the bindery floors for 250 pounds, the foundry 350, the composing room 250, shipping wing 400, offices 60, storage rooms from 120 to 250 as required, and roof 40 pounds.

Ceiling Heights. The height of the machinery should be ascertained, and the necessary space for operation between its uppermost part and the ceiling, while in use, arranged for. Generally the pressrooms, especially those with the high type of press, require the greatest ceiling height. The foundry should have rather a high ceiling for the quick upward escape of gases from the machines. Where ceilings are made of unusual height to accommodate presses the use of mezzanines may result in economy of space in certain parts of the building where no presses are to be installed. Due consideration should be given to the projection below the ceiling of vent ducts, sprinkler devices, waste paper chutes, etc.

Walls and Their Finishes. To finish interior walls they may be painted white. When walls are to be plastered and painted or enameled white, generally the plaster is brought to a smooth finish.

White brick on the inside eliminates the cost of painting, is neat in appearance, can be washed down for cleaning and is indestructible. At columns the white brick may be considered as fireproofing, thereby eliminating the usual brick, tile, or plaster and paint. Brick would be better than plaster, owing to possible vibration in the building. In many instances plaster has proved undesirable as it may fall off and drop into the machinery, especially if applied to the ceiling; therefore the best surface is some material that is part of the wall itself. Rooms in the basement, if important, such as dynamo room or superintendent's office if located there, should have walls finished with a white

enameled brick or white glazed tile up to the ceiling, a white tile floor and a white enameled ceiling.

Chutes for Rags. It is deemed advisable to have a sheet iron chute, about 20 inches in diameter, on the *outside* of the building for the deposit of waste rags. This should be made so that the vertical sections lap over the lower sections to let the rags slide over without catching, or else to have a flange type of lock joint.

On each story there should be a fireproof self-closing door and frame, the door about 20 x 30 inches high and 3 feet, 6 inches above the floor, the frame to connect with a branch chute of sheet iron connected with the main chute. At the bottom of the main chute there should be an inclined slide to a fireproof room in the cellar where rags are baled and made ready for shipping. Firms willing to assume a heavy fire risk have these rags deposited in metal cans on various floors, then carried to the elevators and taken to the basement and finally shipped out. This is an expensive and dangerous method.

General Office Space in Shaw Building, Chicago
Note excellent light from saw tooth windows
D. H. Burnham & Co., Architects

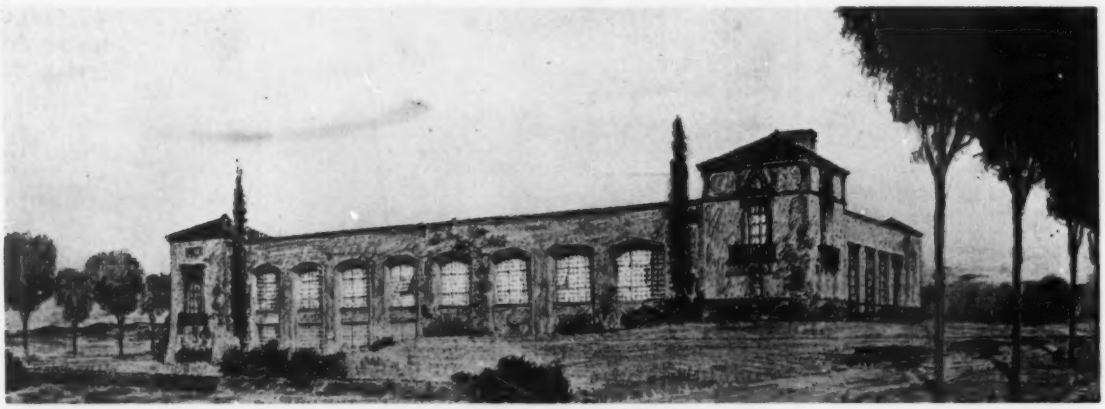
Waste Paper Chutes. Chutes for waste paper should be installed, preferably two, one for white paper only and one for colored or mixed paper. They should extend from the top story down into the baling pressroom in the cellar. They may be of the suction or of the gravity type. The client may desire to have all the paper, white and mixed, go into one chute, not caring to bother with the separate method. In the sale of waste paper, clear white paper brings much more than mixed, and this difference in price would amount to something in a large plant at the end of a year. The main chute, running vertically through the building, is usually about 3 x 4 feet or may be round. The walls may be constructed of brick or hollow tile and the interior lined in sheet metal, the horizontal joints of which should be made so that the upper sections extend over the lower sections to permit the paper to fall without catching.

The main chute should have an opening on each floor, also of sheet metal, built with the bottom inclined about 45°; the opening should be about 2 feet, 6 inches above the floor, with a cover about 2 feet, 6 inches square, arranged with a fusible link so that when the cover is left open fire in the building will melt the link and automatically close down the cover; this entire branch should be kept within 20 inches of the face of the wall.

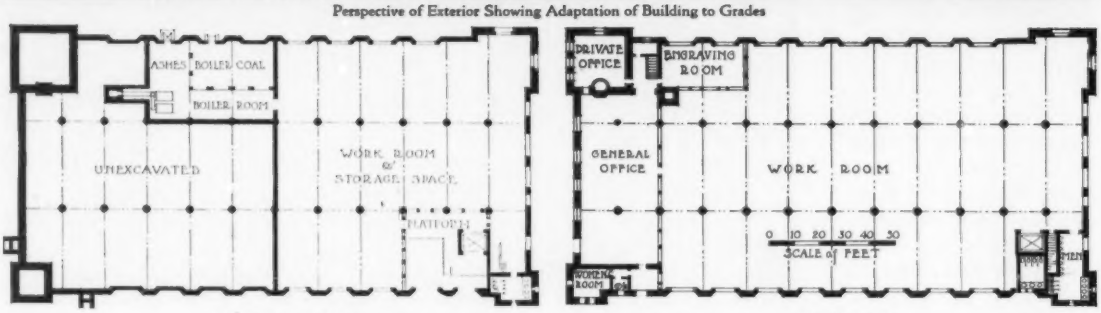
Flooring. After considerable investigation it has been found that, of the many floor surfaces, wood is the best from the standpoint of vibration, shock absorbing and wearing qualities. Cement finished floors are usually squared off with expansion joints, and when a truck with iron wheels for conveyance of paper rides over these joints, the impact in time will crack the cement and it will break up, leaving the floor in bad condition. The use of special surface finishes over cement makes a better surface than bare cement, but will not prevent the cracking. Cement finished floors are hard on the feet of workmen and have a slowing down effect on the men. If a cement finish is used it should have a sanitary cove base at the walls and around columns of about 2-inch radius.

The regulations of some cities require that benzine, gasolene and other highly inflammable oils be placed in cans kept outside of the building. This may be done by building a sheet iron compartment in the wall under a window to set the cans into, with one or two sheet iron self-closing doors. This will project beyond the face of the wall and should be made waterproof.

Elevator and Conveying Facilities. Elevators, dumb-waiters, etc., whether for the handling of freight or people, should be located so as to elimi-



Perspective of Exterior Showing Adaptation of Building to Grades



Basement Floor Plan First Floor Plan

Printing Building of Arthur Thompson & Co., Baltimore, Md.
Edward L. Palmer, Architect

nate interference with machinery and use of floors. In the older type of publishing building, elevators to serve both the handling of freight and the passengers were customary. Separate freight and passenger elevators are far better and are now in general use.

On each floor, especially in the bindery and the pressrooms, overhead carriers with trolley, electrical or hand operated on a steel beam attached to the ceiling construction, should be installed. This will facilitate the moving of paper to the platforms without the necessity of using the hand truck.

Electrical Power, Lighting and Vacuum Cleaning System. The subject of power, its transmission and distribution, to be readily applied is too wide for comprehensive treatment in this limited space. It is generally advisable to use the power furnished by the local power company rather than to install the expensive machinery necessary and to incur the expensive upkeep of the individual power plant. Many firms have locked the doors of their power rooms and are using power from the electric company.

Telephone and Telegraph Facilities. Certain forms of publishing depend very largely upon the telegraph and telephone as means of securing news. If these utilities are very important they must of course be adequately provided for, and rooms be arranged for telephone apparatus and operators of the telegraph and wireless systems. Here may also be the switchboard for telephone service between the different departments. Telephone booths should be placed in convenient places, particularly in the pressroom or wherever else noise might make the use of the telephones difficult. Provision should be made for at least one or two "slot" telephone booths which are wholly separate from the telephone equipment of the rest of the building.

Generally the different machines in the pressrooms, binderies, monotype and other necessary rooms have individual motors which should be set on iron frames firmly attached to the machines so that there will not be different motions of floor and machine which would impair the working of the machinery. Provide for "pits," if necessary under machinery, and install several portable lamps under the press frames to be used for examination of working parts, and have individual switches for these on press frames. Provide an electric meter on each floor to keep a check on the power consumed.

Branch lines from the main line to the motors, controllers, telephones, etc., should be in metal pipes under the finished flooring. On the surface the exact location of these lines should be indicated by driving metal tacks or nails several inches apart if the flooring is of wood, and if the floor is of concrete very shallow holes should be bored. This will assist if the line has to be extended or altered.

If the building is tall, the installation of one or more continuous electric shafts housing the main floor switchboards is advisable; the high power main lines should be screened off for safety, and the

shaft should be built with incombustible walls. Inserts and eyelet holes for hangers on ceiling for electric pipes, etc., should be embedded in floor construction during the process of building.

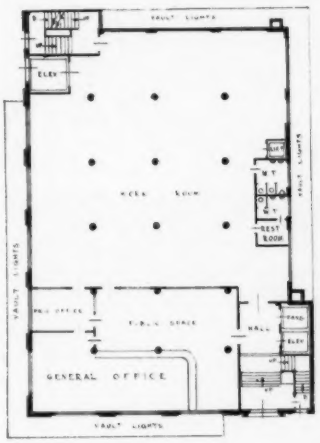
Lighting. This is a subject upon which different opinions exist. If the ceiling is flush, the indirect system is good, each fixture being fitted with a 200-watt nitrogen lamp; the spacing of the fixtures should allow about five watts per square foot of floor area. For semi-indirect lighting, use a fixture with opaque reflectors or globes having about a 100-watt nitrogen lamp. Over the delivery ends of the presses use a 300-watt lamp.

Where color work is done the lamps over the delivery end of the press and over the foreman's examination table should be of the daylight type, throwing a bluish ray which usually shows the different color effects better than the ordinary lamp. Arc lamps with carbon sticks have been found undependable. In the machine shop, carefully locate lights over the machinery in such a way as to benefit the workers the most; the selection of the proper reflector is also very important.

Circuits. Circuit-breakers are more desirable than switches, since to renew a fuse on a blow-out is expensive. Each press or machine should be on an individual circuit to prevent loss of time in stopping other machines. Lights over presses and machines should be on single circuits for the same reason, and lights under press frames should also be on individual circuits.

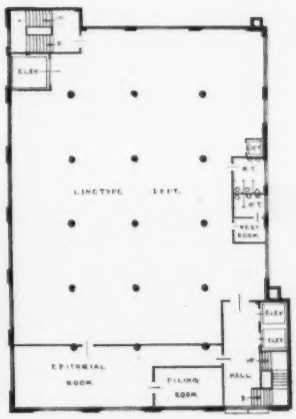
For recording provide indicating meters and gauges for light and power, assembled in the building superintendent's office or in the electrical room in the basement to afford complete supervision of operation and to give a general check on the efficient performance of equipment and the cost of the service.

The Vacuum Cleaning System. A vacuum system is undoubtedly the best method of keeping the building, machinery, etc., clean, as sweeping only raises and distributes the dust and the floors are seldom mopped. A main system or rising line should be installed with outlets on each floor, all

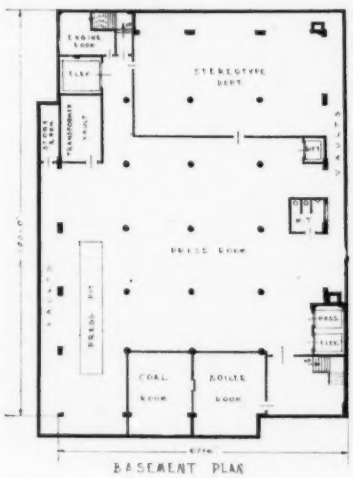


FIRST FLOOR PLAN

General Exterior View



SECOND FLOOR PLAN



BASEMENT PLAN

"Star" Building, Long Island City, N. Y.
Edward Hahn, Architect

located conveniently. The different machines may be cleaned in detail by the use of this apparatus when the machines are not running.

The Plumbing System. At the leader head a type of sliding box or joint with laps, etc., should be built, otherwise a possible continual quiver in the structure will rip the box from the roof proper. This is a source of much annoyance and expense in many buildings now in use.

At the soil and vent lines, a sliding joint should be used. The copper or galvanized iron flashing built into the roofing should follow up the side of the pipe for about 18 inches and there have a slip sleeve, and from this point up to the joint in the pipe, all well connected and watertight. This will give two sections of metal, the upper tightly fastened to the pipe and the lower tightly fastened to the roof with the upper section overlapping the lower for the water to drip off.

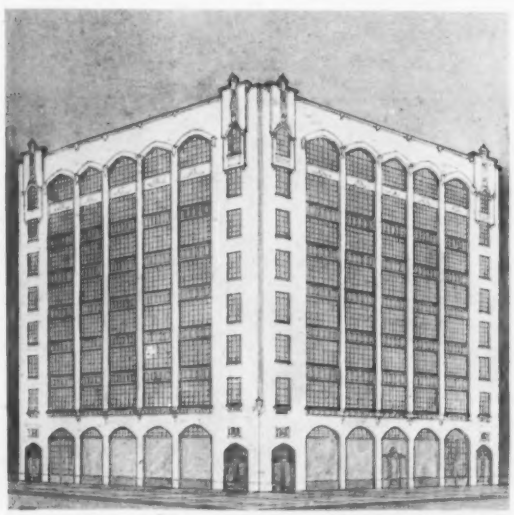
The foundry and photographic departments have, as waste, dangerous acids which should not be sent down an ordinary cast iron line, as the acid will eat through the joints in a short time. A suggestion may be to install an earthenware tile pipe approximately 5 inches in diameter with long tube with composition of wax or asphalt in the joints; this main line should have a horizontal branch line with pitch of ½ inch per foot to branch through floor to fixture in the foundry above. For this, place in the cellar a clean-out box, also to act as a trap and to be placed in the horizontal line, just before it enters the house sewer. Tile pipe has been acceptable for the vertical runs, but the vibration of the building usually disturbs the joints in the horizontal runs, causing them to open. Several buildings have the acid line of a special metal capable of withstanding the effects of acid. The joints are of couplings and asbestos rope.

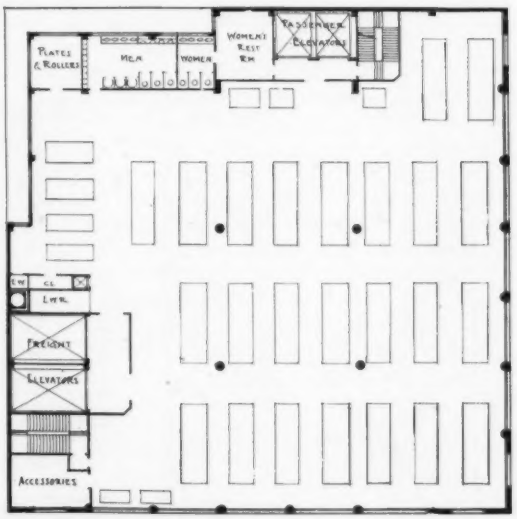
Temperature Control. It is essential that the temperature of the pressrooms be uniform at all times, not entirely for the comfort of the workers but also because of the curious effects that changing temperatures have on paper, ink and presses. Varying humidity is a serious condition because of the effect on the paper, especially while being printed and later when sheets are bound.

Heating, Cooling and Ventilation. This is a special subject, beyond the scope of this article, and should receive very thorough study for each case. Desirable heating systems are: steam, vapor vacuum, or hot blast type using fans and coils and ducts. The latter type is recommended as it saves floor space, but it is more expensive than the other types. Locate the boiler flue outside of the building if possible, so as to eliminate the uneven temperature caused at the place where the flue would be located. Where the heating and plumbing pipes pass through the floor construction, they should have metal pipe sleeves and extend about 4 inches above the finished floor surface, secured to risers, to serve as dams for accumulated water.

Probably the best method of controlling the atmospheric conditions and eliminating drafts is to keep the windows shut and have ventilating ducts with inlets and exhausts on each floor. This system will be found satisfactory at all seasons as the air supply can be heated for the winter and cooled for the summer. The locations of the main inlet and the main vertical ducts depend entirely on the plans, conditions, etc.

Painting. Avoid the use of paint as far as possible in the rooms holding machinery, this being a source of annoyance in many plants. To obtain a clean effect, the use of a reliable good white glossy enamel may be considered, the glossy finish being preferable to dead or dull finish as it reflects light.





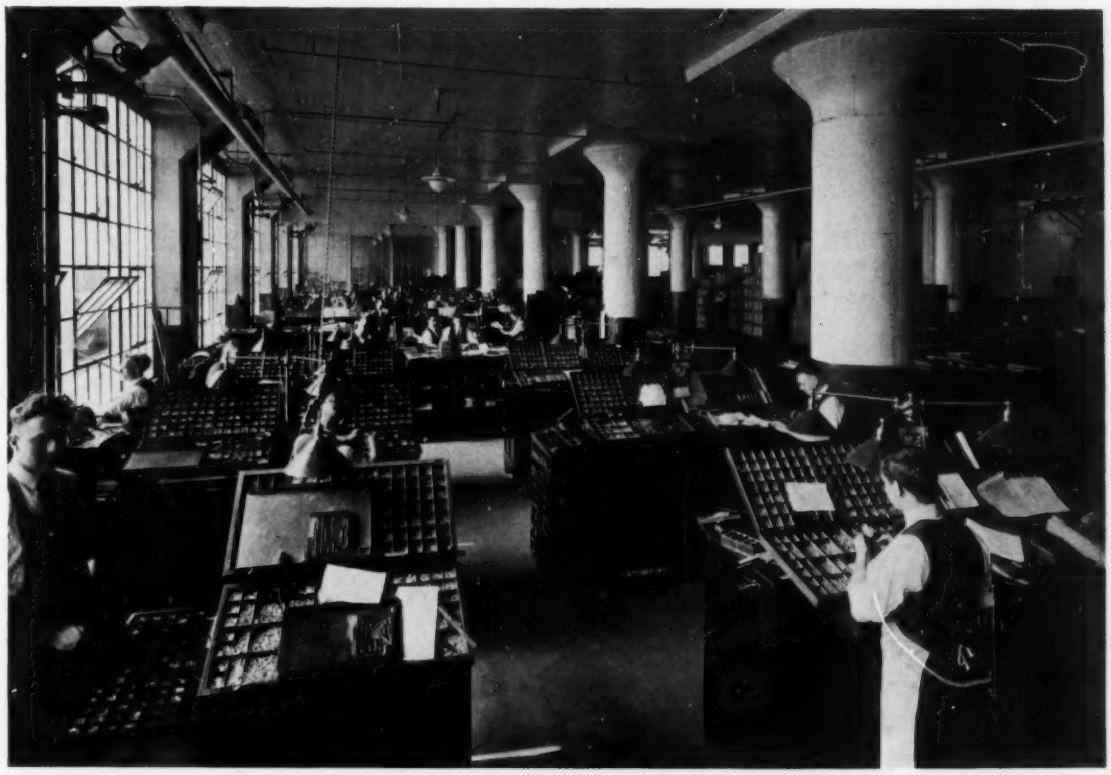
Exterior Study and Floor Plan for Printing Arts Building, New York
George Nordham, Architect

Three Recent Printing and Publishing Buildings

A GREAT variety of structures are used for different branches of the publishing and printing business. In some instances such buildings house merely the activities concerned with actual publishing, while in other cases publishing is merged with the carrying on of the necessary manufacturing operations, such as printing, binding, etc., and a structure designed to accommodate all these allied departments. There is also a wide variety in the design of buildings intended to be used for printing and publishing.

THE METROPOLITAN PRINTING BUILDING, LONG ISLAND CITY, N. Y. With some 25,000,000 policyholders, the volume of printing required by the Metropolitan Life Insurance Co. has already reached a tremendous volume. To provide for its increasing business the Company has erected this five-story building which it will ultimately occupy entirely, space being now rented upon ten-year leases to tenants, printers, binders and engravers who can, when necessary, supplement the Metropolitan's own plant.

The building occupies a triangular plot, the area of a typical floor being 65,200 square feet. Excellent light is had from all sides, and in addition the interior is lighted by an open court about 66 feet in length on its longer sides. Each of the tenants is provided with a moving and shipping booth for freight moved by vehicle or by railroad, this latter service being made possible by a siding from the Long Island Railroad, which runs into the building. Underneath the railroad tracks and truck entrances are placed the coal bunkers, filled from railroad cars or auto trucks by the use of hoppers. Since the building has been erected upon marsh land it is supported upon concrete piles—some 3,000 in number. It is a reinforced concrete monolithic structure, with the exception of the spandrel walls under windows which were cast later, and is of fireproof construction throughout. Column construction is of the "mushroom" type, ranging in size from 4 feet in diameter in the basement to 1 foot, 8 inches in diameter in the upper story; the bays average 20 x 24, center to center. Floors in general are planned for a live load of 250 pounds per square foot. This type of construction permits of unbroken reflecting ceiling surfaces, giving excellent diffusion of light.



Hand Composition Room, Metropolitan Printing Building, Long Island City, N. Y.
D. Everett Waid, Architect

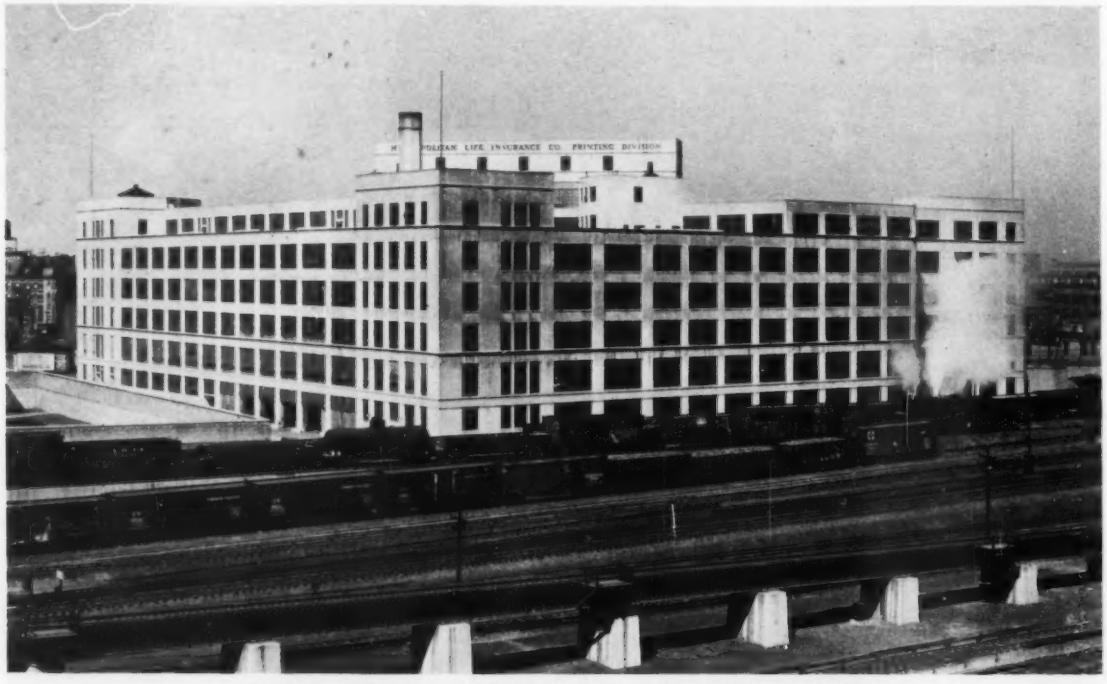
Shipping booths, siding platform and truck entrances, together with a large portion of the second floor have a floor finish of asphalt 1¼ inches thick; other floors are finished with a 1-inch Portland cement finish, laid directly on the slabs after they were cast. This method of flooring gives a much better completed floor than would be possible if finished integrally with the slabs; it admits of greater progress during construction, and the floor is more easily removed in case of necessity.

This structure is served by seven direct-connected combination passenger and freight elevators, one having capacity of 12,000 pounds with speed of 100 feet and the others a capacity of 7,500 pounds with 200-foot speed. In addition to this equipment there are two plunger elevators between basement and first floor serving tenants, and one electric elevator between basement and second story serving the Metropolitan. Each car is equipped with electro-magnetic control with reversing switch operating automatically by various safety devices and by excessive drop voltage; the cars are equipped with an automatic leveling device which aligns the platform of a car to within ½ inch of the floor, and with annunciators and trip recorders and they are separately metered in order that maintenance costs of each may be determined. All gates are equipped with positive electric interlock, preventing movement of the car until gates are closed thus barring accidents.

In accordance with the Metropolitan's well known policy as to the planning of water tanks, the house tank (15,000-gallon capacity) and the sprinkler tank are placed in a penthouse. The sprinkler tank has a capacity of 30,000 gallons, the upper 5,000 gallons being reserved for standpipe service. Wash-up sinks and slop sinks generally are combined in one battery about the center court; wash-up sinks are generally double (usable from both sides) and equipped with spray nozzles for economy in use of water. Drinking fountains are of the two-stream type and are placed at four points in each story. No urinals are provided, water closets designed to take their place having open seat with extended lip; flushometer control is by foot action.

Steam for heating the building and for the hot-water heater and high pressure steam for power are supplied by four portable type boilers of 200-horsepower capacity, one being held in reserve for emergency use. There is also a smaller boiler for summer use. This system is supplemented by feed and vacuum pumps, return and separator tanks, oil separator, etc. All the radiators are controlled by thermostats, and radiators in offices have modulation control valves.

Electric current supplied to this building is 13,200-volt service, 3-phase, 3-wire, 60-cycle. This is transformed within the building by four transformers to 220-volt, 3-wire, 60-cycle for power, and by four additional transformers to 110–220-



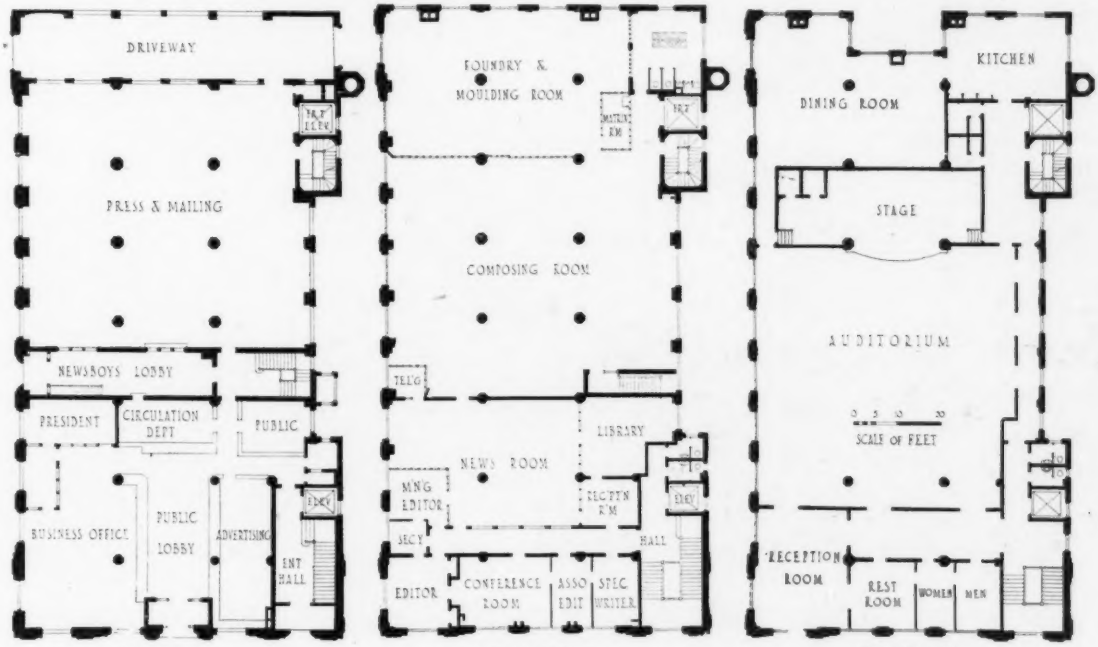
Rear View of the Metropolitan Printing Building, Long Island City, N. Y.
The location adjacent to tracks of Long Island Railroad permits spur track directly into building for shipping purposes. Coal is supplied through hoppers direct from cars

volt, 3-wire, single-phase, 60-cycle for light, one transformer in each case being held in reserve as a spare. Feed lines rise at three central points in the building, each distributed to three points in each story from which the tenants run power lines to the various presses and machines; light distribution panels are located in the same columns. For its own space the Metropolitan uses semi-direct lighting, one fixture in each panel, and in addition capped outlets are provided for the use of drop cords for press lighting. Charging equipment has been provided with outlets in each trucking entrance for charging service vehicles and trucks.

View in Bindery Showing Excellent Light in Working Spaces, Metropolitan Printing Building

This structure has the lowest insurance rate on tenant manufacturing buildings in greater New York. The sprinkler system is 2-supply automatic, under closed current electrical supervision. In each story there are four fire alarm stations equipped with 10-inch gongs. Shipping booths and other places exposed to danger of freezing are protected by a dry pipe system. The architect is D. Everett Waid, who retained as consulting engineer W. S. Timmis who designed the mechanical equipment, and John Derby as consulting engineer on fire protection, including the sprinkler system.

THE A. W. SHAW COMPANY BUILDING, CHICAGO. In planning this structure it was desired by the architects, D. H Burnham & Co., to give it an appearance of dignity since it occupies an entire block frontage in what has always been a prominent residence district. With the exception of type composition, all the mechanical processes necessary for publishing are carried on elsewhere, so that this



First Floor Plan — Second Floor Plan — Third Floor Plan

"The Tribune" Building, South Bend, Ind.

E. R. Austin, N. R. Shambleau, Architects; G. B. Wiser, Associate

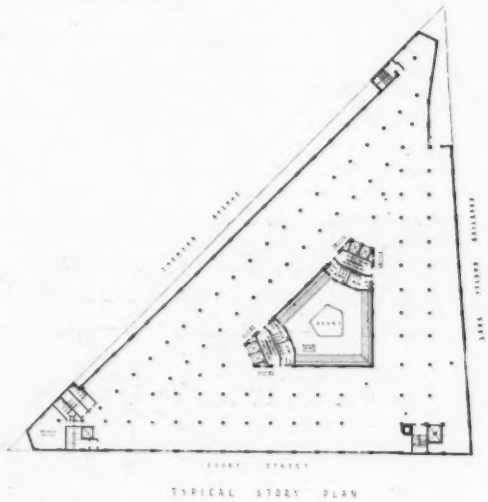
building is intended to be used almost exclusively for executive offices. The structure, two stories in height, has been planned with a view to future enlargement by the addition of a third story. The structure is fireproof throughout.

The exterior walls of the building are of brick, with Indiana limestone facing for the three street fronts. Large windows, facing four directions, are a feature of the design, and to afford additional light for the central portion of the upper floor a system of sawtooth skylights has been introduced which floods the entire working space with light without producing sun glare. In the basement are the heating and mechanical plants. Upon the first floor, in addition to the vestibules, entrance lobbies, stairways, check rooms and toilets for employes, are arranged the departments which need not be in close proximity to the executive offices.

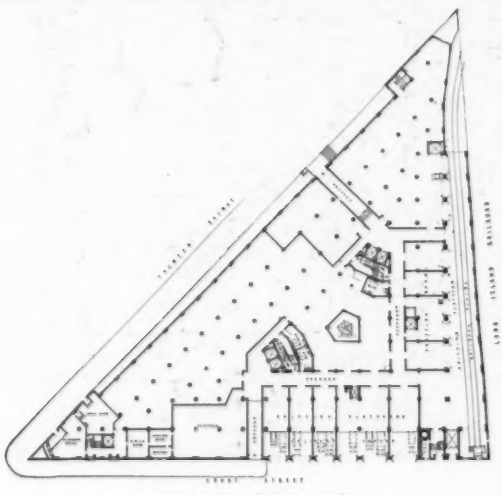
Upon the second floor are the private offices, situated at one corner with the editorial and art departments at one side and the executive offices and library at the other. The remainder of this floor is occupied by the advertising and sales departments and other clerical divisions, by employes' toilets and check rooms and by a luncheon room and kitchen where the employes are given excellent service at moderate cost. The building was completed in July,1920, at a cost of 29.5 cents per cubic foot.

"The Tribune" Building, South Bend, Ind. This structure, designed by E. R. Austin and N. R. Shambleau, with G. B. Wiser as associate architect, is an excellent example of a publication and printing plant for a daily newspaper. The dimensions of the structure proper are 75 x 144, but the basement extends under the 15-foot sidewalks upon two sides, providing space for the storage of 1,000 tons of paper. Upon a base of unpolished gray granite are the concrete and steel walls, faced on the two street fronts with brick of a reddish brown color laid in mortar of a harmonizing tint. The horizontal joints are raked out and the vertical joints left flush with the brick surfaces. Exterior trim is of terra cotta of a color to match the granite base. Window trim and the metal panels between the windows of the second and third floors are of bronze and of a verde antique color.

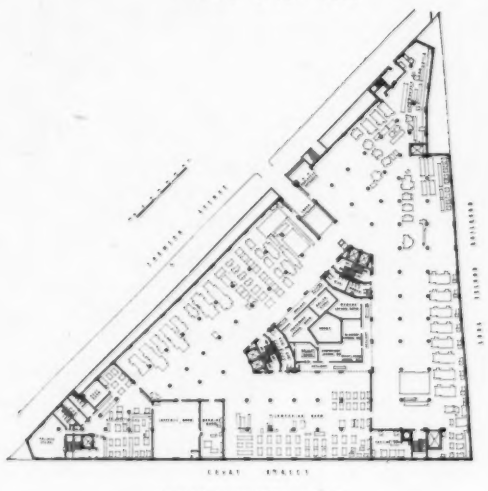
Built throughout to be eventually six stories high, the design permits the construction of the present three stories and yet maintains harmony and a sense of architectural satisfaction and proportion. The floor of the stereotype room, where beams and slabs were used in construction, was planned for a load of 500 pounds per square foot; floors of the composing room are built for 300 pounds, office 100 pounds, and in other parts of the building floors are planned for loads of 150 pounds. For the main press, which weighs 60 tons, a reinforced concrete foundation has been supplied, constructed independently of the building, and at one side of the press is a concrete and steel foundation which carries the 75-horsepower motor operating the press.



TYPICAL STORY PLAN

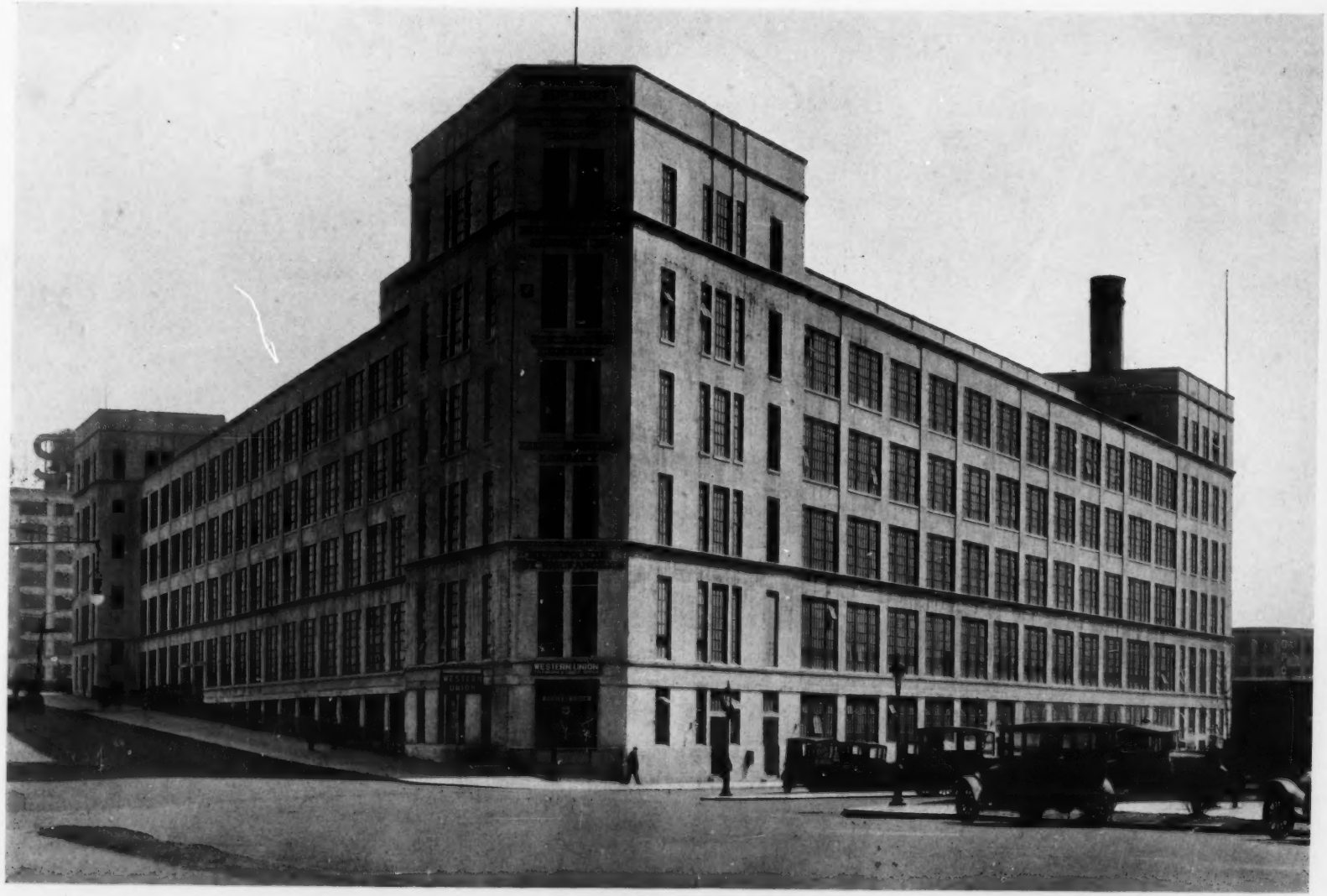


FIRST STORY PLAN



SECOND STORY PLAN

Metropolitan Printing Building, Long Island City, N. Y.



GENERAL VIEW

PRINTING BUILDING, METROPOLITAN LIFE INSURANCE COMPANY, LONG ISLAND CITY, N. Y

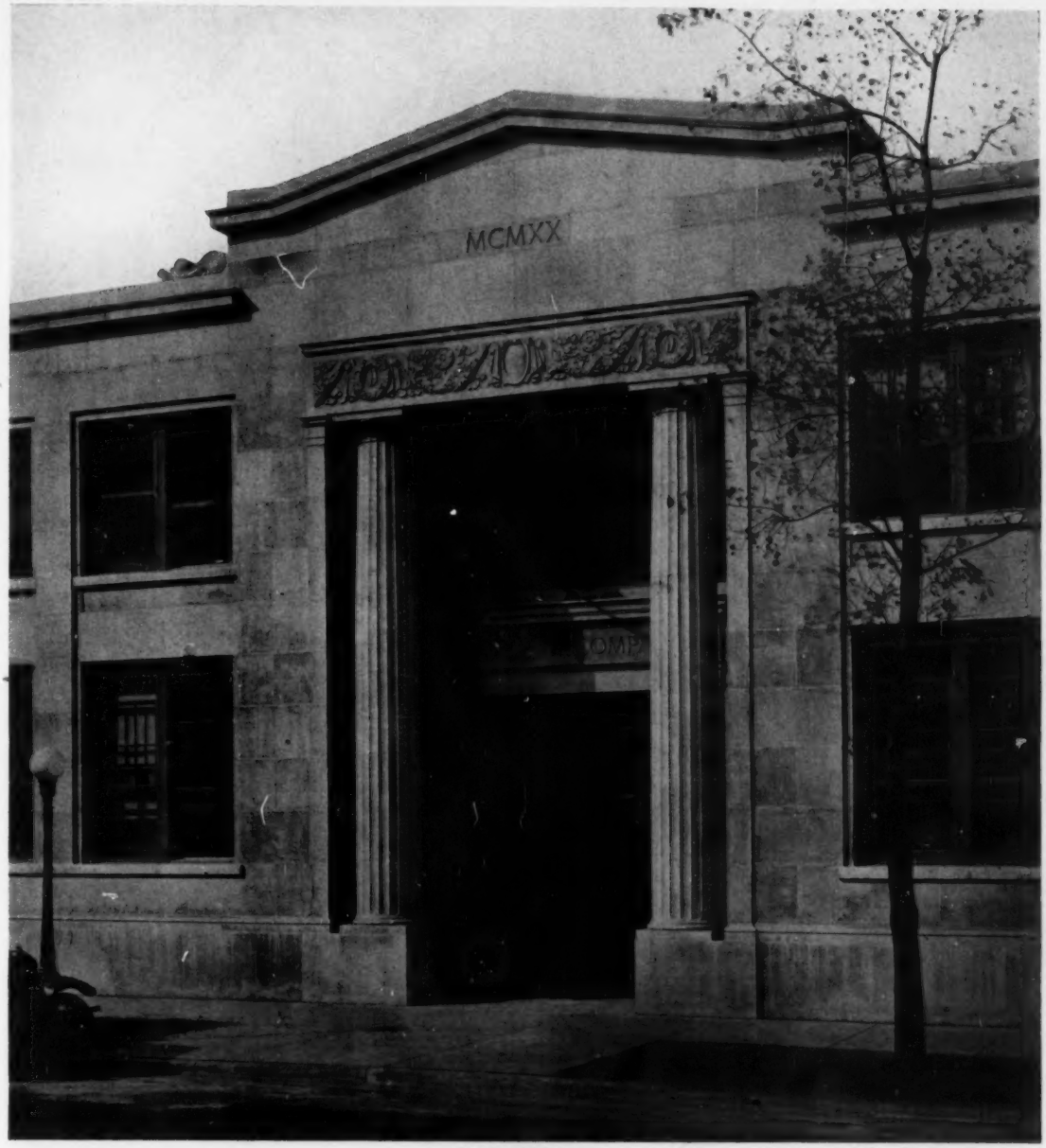
D. EVERETT WAID, ARCHITECT

GENERAL VIEW

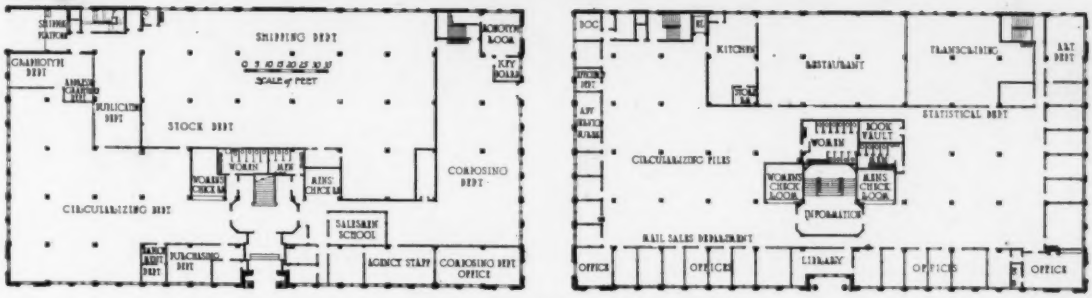
PRIVATE OFFICE

PUBLISHING PLANT, A. W. SHAW COMPANY, CHICAGO

D. H. BURNHAM & CO., ARCHITECTS



MAIN ENTRANCE



FIRST AND SECOND FLOOR PLANS

PUBLISHING PLANT, A. W. SHAW COMPANY, CHICAGO

D. H. BURNHAM & CO., ARCHITECTS

GENERAL VIEW

"THE TRIBUNE" BUILDING, SOUTH BEND, IND.

E. R. AUSTIN, N. R. SHAMBLEAU, ARCHITECTS; G. B. WISER, ASSOCIATE ARCHITECT

BUSINESS & FINANCE

C. Stanley Taylor, *Associate Editor*

The Co-operative Ownership of Apartment Buildings

I. METHODS AND PRINCIPLES OF JOINT OWNERSHIP

ONE of the interesting outgrowths of the housing problem which developed in the larger cities of the United States during the recent reconstruction period has been the revival and broadening of interest in the subject of co-operatively owned multi-family dwellings. Co-operative ownership (or joint ownership, as it is sometimes termed) is not a new idea, but it is only within recent years that its application has been developed along broad lines in this country.

This idea originated long ago in European countries and became particularly popular in Germany and in France. At sporadic intervals co-operative building was attempted in this country, but in the early years of this activity it usually failed because of the lack of proper organization and because the operation was based too strongly on congeniality and the human equation. Gradually, however, such apartment buildings were developed, particularly in New York, so that during the last two decades hundreds of such buildings have been built and financed and successfully operated, but they have caused little comment, until at this time of increased interest in the co-operative idea a more careful analysis of what has gone before is being developed.

On investigation we find that 40 or 50 years ago apartment buildings, particularly of the studio type, were developed in New York and have been operated successfully on the co-operative basis ever since, one structure being of particular interest in that it still has tenants who were original purchasers in the stock of the building.

Co-operative ownership means merely that instead of a group of unconnected individuals' renting portions of a building, a group of persons wishing building space of a certain kind are brought together to pay in rent for an advanced period, thus providing funds to build, and eliminating the speculative and financing profit. The rents which the group of unconnected individuals must pay in a new building built in the usual way for profit to the owner are computed to include returns, not only on the high present cost of construction and maintenance, but on the high cost of financing and on an element of profiteering which has been definitely introduced into the speculative real estate field in the last two years.

We may take, for example, the wild speculation in apartment houses which has been carried on in New York. Here apartment houses have been purchased originally on a basis of six or seven times the annual rental. Immediately rents were raised and the building resold to another speculator or investor. In many cases buildings have been sold seven or eight times in a few months, and the tenants have been forced to pay rents which have been increased to sometimes as much as three times the rentals paid during the pre-war period. It is evident that if the first purchasers had been a group of individuals interested in living in the building, they could have realized a great saving on rental cost which has gone into profiteer financing.

As usual, a realization of this possibility has come to the public somewhat too late in New York; but it is interesting to note that hundreds of existing buildings have recently been placed on the market for sale under a co-operative plan, whereby a tenant purchases his apartment outright, and the building is operated under the usual co-operative methods as described here in later paragraphs.

Naturally, during this period of high rentals, there have been sporadic and unsound attempts at the development of co-operative projects. Many old buildings have been sold on this basis, but under plans which were not properly conceived so that the

ABOUT two years ago several articles were published in THE ARCHITECTURAL FORUM on the subject of co-operative ownership. These articles developed an unusual response, indicating the interest of architects in this subject. As the result of the information provided in these articles and in the answers to numerous inquiries several projects of this nature were actually constructed.

The Editors have recently received a number of further inquiries on this subject. In view of this interest and the fact that there have been a number of interesting developments since the original articles were presented, it is proposed to present a series of three articles covering the subject as adequately as possible. The first of these articles is presented herewith and the following will complete the series:

2. *"The Promotion and Financing of Co-operative Building Projects."*

3. *"Recent Examples of Successful Joint-Ownership Projects."*

Inquiries are invited from architects interested in the development of co-operative apartment buildings, and a special service is offered to readers for suggestions regarding specific problems.

general idea of joint ownership may often be hurt through the failure of projects not properly studied from the business, design or construction viewpoint. It is a fact, however, that practically every co-operative apartment project which has been carefully developed and promoted with the single idea of benefiting a group of tenants and not of being unduly commercial in the requirement of large profits for the promoter or the builder, is showing successful results. Several such projects will be described in a later section of this series of articles. Meanwhile, it may be noted that the interest of the public in co-operative apartment buildings is increasing greatly, and it may be confidently forecast that within the next few years a large number of such projects will be successfully developed. This type of building invariably requires architectural service, and in order that the architect may render efficient service it is necessary that he be fully informed as to the nature of such projects from the viewpoints of the promoter and investors.

Methods of Operation

There are three general methods for carrying out joint-ownership projects:

1. The formation of a stock company to provide the necessary equity. This is the plan heretofore described in which about 40 per cent of the building space was occupied by owners and 60 per cent made available for renting purposes, the rental income being used to defray expenses on the entire building.

2. Another plan which has been used successfully for the development of small buildings has been what is called straight co-operative building ownership. In this plan a stock company is formed, and the entire space is occupied by owners. For instance, if ten individuals formed a stock company, a building was built containing ten apartments, and the actual ownership of each apartment was vested in an individual who contributed to the purchase of stock. This plan had the advantage of a less involved financing operation, and the building was operated by a committee of tenants. Each apartment owner paid an annual owner's rent of an amount so figured that the total rental would equal the approximate renting cost. At the end of a year a deficiency payment was required or a rebate given, depending on whether or not the cost of maintenance overran the total of owners' rentals. This is a simple plan which has proved successful in bringing all the benefits of ownership to the individual apartment tenant.

3. A third plan which has been successfully used is a combination of the two plans just outlined. This involves the formation of a stock company and the provision of rentable space, but also charges for rent of the apartment at the prevailing market rates. At the end of each year's operation the profits of the building are divided and rebated in cash to the stockholders, thus accomplishing in effect the same condition as in the first plan discussed, a plan which is often adopted.

In discussing various methods in articles on this subject in THE FORUM in 1920 it was difficult to determine which would be the most successful. Recent experience, however, indicates that the profitable plan is that outlined under No. 2. This is known as the straight co-operative ownership plan in which the entire building is occupied by tenant-owners without any rentable space. It has been found that this plan is recommended by its simplicity of operation and by the fact that it requires a smaller investment than for a building where a certain proportion of space is to be rented at market rates.

Development of Project

The first step in the development of a co-operative project is its incorporation. Title to the land and building should be conveyed to and held by a corporation made up of the tenant-owners, the charter of which should limit the corporation to the ownership and operation of the building, in order to provide against possible speculation in other enterprises by action of a majority of directors and to insure the proper distribution of the proceeds of the sale of the building should a sale be effected.

The points just outlined should be given careful consideration by the purchaser of a co-operative apartment. He should know definitely what he is buying, and in a restricted corporation as outlined here he does know. Inversely, from the viewpoint of those interested in developing co-operative apartment housing schemes, it is well to realize that this form of incorporation safeguards the investment of the individual stockholder, and is the best and easiest form for successful promotion.

It may be noted also that the development of the co-operative project is not today so personal a matter as in the past, but is usually carried out by interested individuals who will profit by some phase of the transaction which comes within the scope of their business activity. An architect, a builder or a landlord may be the active means of developing a co-operative project to a point where benefit may be received by all persons interested.

Assuming that a stock company is formed for the purpose of providing the necessary equity, we find a possibility of admitting to the advantages of co-partnership those who may not have sufficient funds to buy stock outright. A plan has recently been worked out by several building corporations through which the purchasers of stock are required to make a first payment, and allowed several years in which to pay for stock on the installment plan, at the same time occupying their apartments. The actual equity financing in such cases is done by the building corporation or by others primarily interested, and their money is returned to them by the installment payments of the actual purchasers of stock who are living in the building.

Details of this plan will be given in the next article of this series, to be published in the September issue.

In developing a corporation of this type it is usual to include the ownership of but one building in one corporation. The new company is capitalized for the amount of the equity, the entire stock being held by the stockholders in proportion to the size of the apartments occupied by them, and all apartments in the building are leased to stockholders for their own personal occupancy.

Provision must be made to enable the stockholder to vacate the apartment occupied under the terms of his ownership lease. It is found that the best method for doing this is to allow him to vacate at the end of any yearly period after having given three months' notice to his associate owners. After vacating the building the shareholder may either retain his share in the building, on which he will receive a dividend, or he may sell it. The assignment of the share in the building, however, should not carry with it the right to the new buyer of leasing and occupying the apartment in question until the prospective tenant has been passed upon by the whole corporation or its agent.

Frederic Culver, president of the Joint Ownership Companies of New York (a member of the Consultation Committee of THE ARCHITECTURAL FORUM) who has successfully promoted a number of buildings of this type, makes these interesting comments:

"It is safe to assume that no residence designed for individual occupancy can be produced or operated as economically as a building of the same character designed for group occupancy. When you add to this the many burdens thrown on an individual in the administration of his individual unit, you touch one of the potential causes leading to group living in city and suburban districts. Add to this the economies practiced by commercial landlords, want of proper scrutiny of tenants allowed to rent in large buildings, unexpected, inconvenient and inordinate increases of rent and many similar annoyances and you have other causes which impel wise people to turn to group building.

"A purchaser of stock in a co-operative building, reflecting the savings derived by quantity production and carrying only a reasonable profit to the promoter-constructor, acquires a habitation suited to his requirements cheaper than it could be produced in any other way. When the operation is concluded the stock should be worth more than it cost. The owner of the stock also enjoys the advantages of co-operative administration, has a voice in the management of the property, can treat his apartment in any way desired, is forever free from increases of rent, and in a comparatively short time amortizes his principal investment through the savings made.

"A co-operative apartment building should discard everything which costs money without adding commercial value. All lines and proportions should be used for architectural effect to the exclusion of expensive materials, and the apartments should be completed in the simplest manner possible, leaving the occupant to make his own expenditures on the interior treatment. These features, coupled with a fixed rent for 95 years, make for the economy and pleasure of this type of ownership and occupancy.

"The floor plan having been adopted, disinterested real estate experts, with knowledge of local renting values of the district, should be asked to appraise the renting values of the various apartments, and on these disinterested opinions of revenue values and expert advice as to operating expenses the whole financial structure should be based. The profits to be made by the promoter-contractor for all services in the conception, planning, financing and erection of the building should in no instance exceed 15 per cent of the total cost, and this should be the only profit in the enterprise; otherwise, in most cases, it will penalize the investor.

"After satisfactory title insurance is obtained and a demand for the stock is manifested the enterprise should proceed. The voluntary purchase of the stock of such an enterprise is the justification for its creation. Such an enterprise can safely assure to the owner a return of from 10 to 15 per cent annually on the investment, either in occupation or through sub-letting. Those who promise rent free or benefits more exaggerated than this are treading on dangerous ground."

Management of Building

After completing the incorporation and the sale of stock the usual procedure is to appoint a management committee selected from among the tenant-owners and usually in proportion of three out of each ten. This committee will control the general management of the building and general business policies, acting in a manner similar to the board of directors of a business corporation. Experience has shown, however, that the details of actual building management should be delegated to a reputable and competent individual or real estate firm, experienced in the management of properties of this class. Accounting on rental income and maintenance expenditures will be made by this manager to the committee of tenant-owners usually in the form of a monthly report. This committee in turn reports to a stockholders' meeting at regular periods of six months or annually. The fact should be emphasized that the share of the ownership in the building should be separated from the tenancy; a schedule of rents adopted for each apartment which, in total, would provide an income sufficient to pay the expenses of operation and fixed charges, including taxes, etc., a fixed amount to be set aside for the amortization of the mortgage and a balance sufficient to pay a reasonable return on the investment in the form of dividends. Leases should be entered into between the tenant-owners and their corporation, providing for

annually renewable leases, containing proper restrictions and the provision that they cannot be terminated except for failure to perform or upon notice from the tenant to the landlord on the first day of July, terminating the lease on the first day of October following, in which event the apartment can be re-let for the benefit of the tenant-ownership corporation. Or a plan should be adopted which should include in the rentals paid by the tenant-owners an income sufficient to meet all fixed charges and amortization, and in addition a sum to meet contingencies.

The importance of the location of joint-ownership buildings cannot be too greatly stressed. As co-operative housing is for residential uses the utmost care should be observed to build only in firmly established residential neighborhoods. Not only is the careful selection of location for a building of this type important, but care must be taken to anticipate the class of residential occupancy.

It is well known that in the average city certain neighborhoods are definitely classified by the type of people who may be developing homes in the vicinity. Consequently, in locating a building of this nature the advice of real estate experts should be sought in order to analyze the trend of development, not only to avoid commercial or industrial development in a city or town not protected by a zoning plan, but to determine as closely as possible the character of residential occupancy which may be expected for years to come. This is often indicated by the price of land, which though high may be desirable because of its value as a determining factor in the class of construction and occupancy which may be expected.

Frank Mann, Tenement House Commissioner of New York, has reported favorably on the idea of the joint-ownership residential building provided the various precautions indicated in this article are taken. In regard to the purchase of the land he says, "In buying land for buildings of this nature it has proven better to buy land in already well established residential neighborhoods, even though the original cost is much higher than in partially developed sections. The neighborhood which already bears the stamp of high class residential development, particularly if the land is protected against commercial and industrial encroachment through the medium of long term restrictions, offers the best location for a building of this nature.

"In general, the building should be located within easy transportation distance of business and amusement centers, and in planning the building a definite class of occupancy should be determined upon and catered to, both in plan and location.

"Care should be taken as to the examination of title by the employment of a title company or a reputable lawyer to see that the title offered is marketable, or that it is free and clear from all incumbrances, except such as shall be definitely agreed upon.

"If the property is purchased subject to a mortgage, the mortgage should be either for a long term with an amortization plan or a savings bank mortgage, which is reasonably certain of permanency, and in no case should the mortgage be for more than 60 per cent of the market value of the property. The plan should include the setting aside of a certain amount annually for the retirement of the mortgage."

As indicated in this paragraph, the co-operative ownership method offers particularly good inducements to institutions or individuals having money for loan on real estate. As nearly as can be determined, there is no record of a co-operative apartment house having undergone a foreclosure of mortgage.

In the usual co-operative plan, as Mr. Mann says, a sinking fund is established which will gradually retire the mortgage. Each owner in paying an established owner's rental pays an amount toward this sinking fund. Naturally, as the mortgage is reduced the equity is increased, so that this sinking fund is in effect an owner's savings account.

Old Fine Arts Building in Which A. I. A. Convention Banquet was Held

Concrete Construction

II. MIXING AND PLACING OF CONCRETE

By WALTER W. CLIFFORD, *of Clifford & Roeblad, Engineers*

CONCRETE is manufactured to order on each job, according to the architect's specifications and under his supervision. Not only is this so, but it is made largely from local materials which cannot be standardized. Cement,—always Portland cement on modern construction,—aggregates and water are the raw materials of concrete. To these are sometimes added small percentages of foreign matter for coloring or waterproofing. Portland cement is made from limestone and clay, approximately three parts limestone being used to one part clay. These are ground together, fused to a clinker, and then ground again to a fine powder. Gypsum is added to the finished product in order to regulate the time of setting. Portland cement differs from natural cement in being absolutely uniform in quality and in being carefully proportioned to give maximum strength.

The principal standard specification requirements for Portland cement are strength, soundness and time of set. Fineness has a very great influence on the properties of cement. The finer the cement, the more readily and completely does it react with the water. Furthermore, since one of the functions of the cement is to coat all particles of aggregate, it is obvious that with a given amount of cement the finer it is, the greater will be its covering power. The standard specification is that not more than 22 per cent of the cement shall be retained on a sieve having 200 meshes per linear inch.

The standard strength test for cement is a tensile test. This is because the tensile test is simpler to make and has been considered a fair comparative indication of the compressive strength. When mixed with standard Ottawa sand in the proportions of 1:3, a satisfactory cement should have a strength of at least 200 pounds per square inch at an age of 7 days, and a strength of 300 pounds at 28 days. Also, it must be stronger at 28 days than at 7 days. This test will probably be superseded by a compressive test before many years. Soundness tests are made to detect an excess of impurities, commonly found in cement rock, such as free lime, magnesia or sulphates which will cause the cement to swell, disintegrate or crumble during setting. For this test a cement pat about the size and shape of a thin-edged cookie is made on glass, and exposed over boiling water for five hours as an accelerated test. A satisfactory cement should remain firm and hard. If the results of other tests seem to indicate adulteration, chemical tests are made and standard specifications give limits for impurities.

Time of setting is not a criterion of quality, but it is a very important factor in the use of cement. A cement which sets too quickly interferes with placing concrete, while one which sets too slowly delays the work. The process of setting or strengthening is a continuous one which goes on for many months, probably for many years. Two stages in the process have been taken for testing, and are called initial and final set. They are determined by the time at which the cement will bear the pressure of needles of fixed weight and size with a certain penetration. Initial set is approximately the stage after which cement will not thoroughly unite along the surface of a break. With the standard Vicat needle the minimum specified time for initial set is 45 minutes. As a factor of safety, 30 minutes is used in the better concrete specifications as a limiting time within which bonding of consecutive pourings shall be done. Final set is the stage when the concrete has appreciable strength—when it is safe to walk around on it. For a satisfactory cement the time of final set must not be greater than 10 hours.

Cement as manufactured today by the well known companies is a standard product as dependable in quality as structural steel. Deterioration after leaving the mill, due to improper storage conditions, may, however, be less obvious than heavy rust on steel sections. Nevertheless, on the average job the aggregates, particularly the fine aggregates, are more open to suspicion and in need of tests than is the cement.

Aggregate is the term applied to the inert materials which compose the bulk of ordinary concrete. The obviously necessary requirements of concrete aggregates are that they shall be dense, hard and durable. The division of concrete aggregates into fine and coarse, or in more usual terms sand and stone, is purely arbitrary. Fine aggregate or sand is usually considered as that which will pass a ¼-inch screen. Coarse aggregate is that from ¼ inch up to the specified maximum size.

Fine aggregate as used is either natural sand or crushed stone screenings. Natural sand, being the result of rock disintegration, partakes of the nature of the parent rock. Through the law of survival of the fittest, quartz is the commonest constituent of natural sand. It is a satisfactory sand. Bank sand is most used, but unless of known quality it should be tested. Beach sand is often satisfactory if not taken so near the tide line as to contain organic matter. It is sometimes too fine to be used alone in first class work. Sand must be clean. Clay is harmless in itself and may add to the density of a lean mixture. In a richer mixture (1:2:4 or better) clay either introduces weak clay pellets in the concrete or by coating the harder particles prevents

the cement from adhering. Silt or loam, containing organic matter in addition to the weaknesses of clay, causes injurious chemical reactions such that one-tenth of one per cent of tannic acid will reduce the strength of the concrete 25 per cent, and a very small amount of loam may delay the setting of the cement almost indefinitely.

Sand tests are "mechanical analyses" which show the grading; *i.e.*, the amount of each size particle, tests for organic matter or other impurities, and strength tests. The mechanical analyses are useful and necessary in economically proportioning the concrete mixture, and the impurity test gives required information concerning quality. Doubtful results in this latter test are checked by strength tests. The first test is made by putting a dried sample through successively smaller screens and weighing the percentage retained on each. For impurities several tests are made. Microscopic examinations show coatings of any nature on the particles. Organic impurities can be detected by the sodium hydroxide test.*

Crushed stone screenings make an excellent fine aggregate if the dust is screened or washed out. The physical properties are easily judged from the parent rock, and freedom from dust is the only needed test. Strength tests are the final criteria for sand, and they are made in compression on 2-inch cubes. Comparison is made with "Standard Ottawa Sand."

Igneous rocks are looked on with most favor in the east for coarse aggregates. The fine-grained rocks like trap are perhaps the best. The granites are good excepting that under great heat they disintegrate, owing to unequal expansion of the grains. This applies to all the coarser crystalline rocks. Of the sedimentary stones sandstone is sometimes satisfactory, if the cementing material or matrix is not subject to disintegration. Limestone is usually a good aggregate, although not ordinarily as strong as the igneous rock. Recent tests seem to indicate that hardness and strength are not so essential in sound coarse aggregate as shape, size and porosity, since any sound stone is strong enough for stresses to which concrete is subjected.

* See "Tentative Method of Test for Organic Impurities in Sand for Concrete," Am. Soc. for Test. Mat., C40-21T.

Gravel, which is stone broken up and rounded by natural processes, is widely used for coarse aggregate. Unless disintegrated, due to being in small pieces, its properties are identical with the rock of which it once formed a part. Cinders and blast furnace slag are sometimes used as aggregate. Cinders have little strength and often a dangerous amount of sulphur. Lightness and cheapness are their only recommendations. They are seldom used except for filling. Slag is much stronger than cinders, and it may make a satisfactory aggregate provided its sulphur content is sufficiently low. Tests of coarse aggregate concern mainly mechanical analysis and cleanness. Gravel in particular is likely to have a film of injurious material, hardly visible to the naked eye.

Water is necessary for the setting action of cement, and it also acts as a flux for spreading the cement over the surface of the aggregate and to some extent as a lubricant for the mass. Most water from sources of public supply is satisfactory. Sea water is not. Oil, acid, alkali salts or vegetable matter are detrimental and often dangerous. Oil can be detected by the characteristic iridescent film. Acids or alkali can be tested with litmus paper and salts by evaporation. Vegetable or organic matter frequently shows in the form of floating particles or turbidity, but not always. Whenever there is any doubt concerning the purity of water, tests of its effect on setting and strength should be made.

Satisfactory materials being obtained, the crux of the concrete manufacture is in the proportioning of the constituent parts. In the early days of concrete, bank-run gravel was frequently used, but as soon as theories of density were evolved it was realized that a natural mixture of sand and gravel was almost never a dense mixture. Tests showed that strength varied directly with density of the concrete in place. Voids in aggregate were studied and it was found that sand and gravel with grains of nearly uniform size and shape had about 45 per cent voids. With a small excess allowance this becomes the one-half which is still the conventional ratio of fine to coarse aggregate. Taking the cement as one-half the sand gives the 1:2:4 mixture which achieved early popularity, and is now by far the

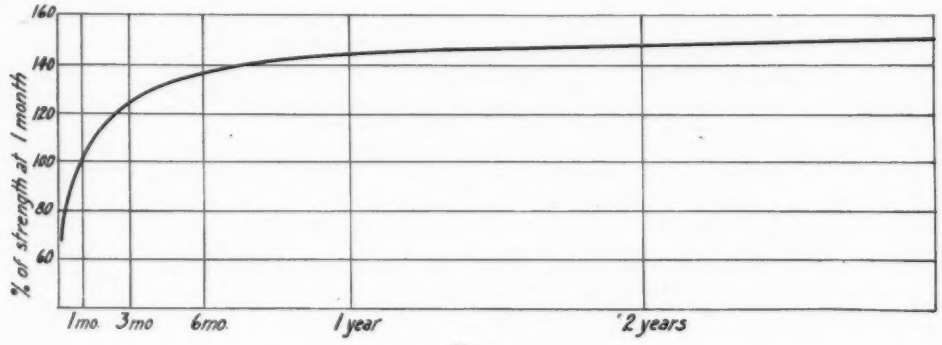


Fig. 1

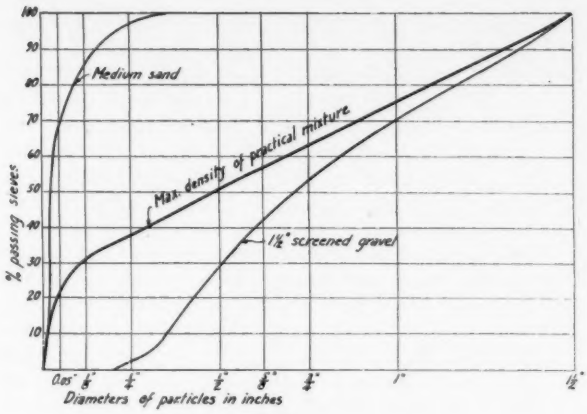


Fig. 2

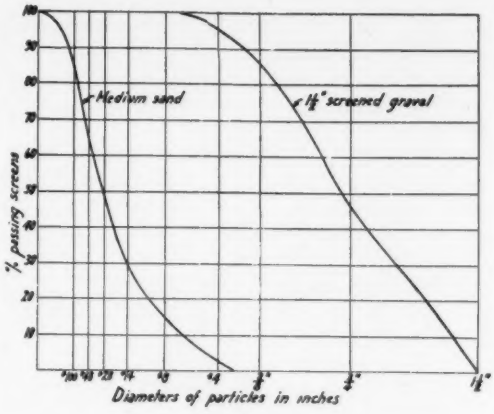


Fig. 3

most used proportion in concrete of the usual kinds.

With the knowledge that a graded sand or stone had fewer voids than one with uniform sized grains,—since the smaller grains can fit in between the larger without increasing the volume of the mass,—came also the realization that by a study of specific aggregates a much denser mixture could be made than by conventional proportions. From mechanical analysis, grading curves of aggregates were plotted. By experiment a combination grading curve for the entire mixture corresponding to maximum density was evolved by William B. Fuller. Recent studies by Chapman, Johnson and others have brought out the theory of surface areas of aggregates as a factor in concrete mixture, since the cement should cover all these surfaces. As a sphere has the least ratio of surface to volume of any solid, rounded grains are obviously better in this respect than angular grains. This is an advantage of gravel over broken stone, and also of rounded sand grains over those conforming to the obsolete sharpness requirement. (Fig. 2.)

Most recent tests by Prof. Duff Abrams of Lewis Institute, in co-operation with the Portland Cement Association, indicate that the strength of a concrete is in proportion to a function of the aggregate called the "fineness modulus." This fineness modulus is the sum of the percentages of an aggregate retained on successive screens of a standard set. The standard set of screens is: 100, 48, 28, 14, 8 and 4 meshes per inch and ⅜", ¾", 1½", etc. It is so arranged that each screen has twice the clear opening of the next smaller. Considering Fig. 3, the fineness modulus of sand or gravel is derived thus:

	Per cent retained on each sieve	
	Sand	Gravel
100-mesh	85	1.00
48 "	65	1.00
28 "	50	1.00
14 "	35	1.00
8 "	15	1.00
4 "	0	.95
⅜" "	0	.85
¾" "	0	.45
1½" "	0	.00
Fineness modulus	2.50	7.25

From the foregoing it may be noted that 1.50 fineness modulus would be a very fine sand, while a stone with a maximum size of 1½ inches would have a maximum fineness modulus of 8.00. From the fineness modulus of various aggregates, that of any combination is easily arrived at. Prof. Abrams' tests show that the strength of concrete increases with fineness modulus of the combined aggregate up to published values varying from approximately 5.00 for a lean concrete mix to 6.75 for a rich mix. Above this strength falls off slightly with increase in fineness modulus. Prof. Abrams reports that the strength of concrete varies directly with the ratio of water to cement—considering only workable mixtures, the more water the weaker the concrete—and that there is a direct relation between the fineness modulus and the amount of water required for a workable concrete. Tests show that too much and too little water are both bad. In building construction, however, it is practically impossible to use a mixture which is too dry for maximum strength. The variation of strength with proportions of water is shown in Fig. 4.

A deficiency in water prevents complete reaction of the cement. An excess of water dilutes the cement so much as to prevent in part its crystallization. Spading brings much of the excess water to the surface, where it runs off, but part of it remains pocketed in the concrete to leave voids after it finally evaporates. Through spading and evaporation the excess water is eventually reduced to the point where the setting process is completed, but the excess water which runs off carries with it much of the finest and most valuable part of the cement, and the excess which remains delays setting and after evaporation leaves weakening voids.

The consistency which gives maximum strength when packed into a test mould does not necessarily give maximum strength under field conditions. A wetter mixture may, and usually does, give greater density and strength due to the readiness with which it flows around the reinforcing and fills the forms. Hence the usually specified quaking mix, which will flow sluggishly around the rein-

forcing, is the best for ordinary work. A field test for consistency—the first standard test of its kind—has recently been adopted by the American Society for Testing Materials (Serial Designation D62–20T).

A frustum of a standard cone is filled with concrete, inverted on the floor, and the settlement or slump is measured. For ordinary building work the slump should be 2–2½ inches. When more sloppy

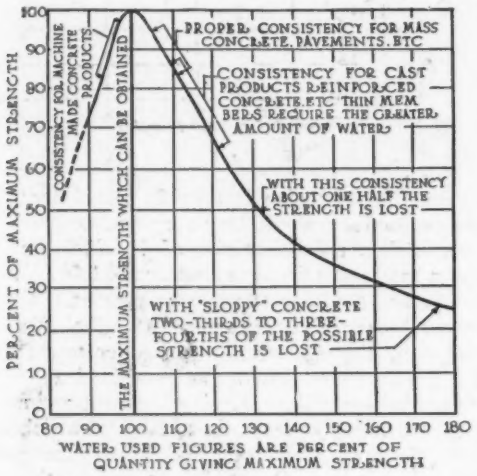

PERCENT OF MAXIMUM STRENGTH
100
90
80
70
60
50
40
30
20
10
0
CONSISTENCY FOR MACHINE MADE CONCRETE PRODUCTS
THE MAXIMUM STRENGTH WHICH CAN BE OBTAINED
PROPER CONSISTENCY FOR MASS CONCRETE, PAVEMENTS, ETC
CONSISTENCY FOR CAST PRODUCTS REINFORCED CONCRETE, ETC THIN MEMBERS REQUIRE THE GREATER AMOUNT OF WATER
WITH THIS CONSISTENCY ABOUT ONE HALF THE STRENGTH IS LOST
WITH "SLOPPY" CONCRETE TWO-THIRDS TO THREE-FOURTHS OF THE POSSIBLE STRENGTH IS LOST
80 90 100 110 120 130 140 150 160 170 180
WATER USED FIGURES ARE PERCENT OF QUANTITY GIVING MAXIMUM STRENGTH

Fig. 4

mixtures are required for special cases, the cement as well as the water must be increased. Using this as a standard and based on Prof. Abrams' tests, the recently issued Tentative Specifications for Concrete and Reinforced Concrete of the Joint Committee of the national engineering societies give tables of proportions of cement and aggregates to give concrete of 1500, 2000, 2500 and 3000 pounds per square inch at 28 days. These tables cover all practical consistencies and all ordinary sizes of aggregates.

From all this discussion two points stand out clearly: First, arbitrary proportions are unscientific and wasteful. As fast as custom and building laws permit, proportioning must be by some such tables as mentioned in the previous paragraph—the properties and method of testing of aggregates rather than the proportions being the points specified; Secondly, the amount of water is of the greatest importance. Excess water may, and often does, reduce the strength as much as 50 per cent.

As was previously said, the setting or increase in strength of cement, and consequently of concrete, continues at a gradually decreasing rate for a year or more. This is indicated in Fig. 1 for average conditions. The strength at 28 days is the figure which is taken as a measure. Under the older Joint Committee Specifications this was assumed at from 2000 pounds per square inch for 1:2:4 concrete to 3000 pounds for 1:1:2 concrete. The former figure was rather a laboratory than a field figure, and in the recently published specification a similar mixture is rated at 1500 pounds. The working stresses for this concrete are not reduced by the same amount, however. These strength assumptions are made on the basis of a 70° Fahr. temperature during the setting process. The rate of setting is materially slower at lower temperatures, as shown in Fig. 5. Owing to the heat generated by chemical reactions, however, the average temperature of the body of the concrete is somewhat higher than the surrounding air. This is particularly the case with large members or masses of concrete.

Foreign ingredients are sometimes introduced into the concrete mixture. Various compounds are used as integral waterproofing, but their use is diminishing. Mineral colorings are used in face mixtures, as considered in a previous article. Chemicals are used to lower the freezing point, and where there is no objection to some loss of strength, some of the compounds sold for this purpose are valuable.

The aggregates for concrete are, in practice, decided by a balancing of desirable requirements with cost of available materials. It is sometimes cheaper to use the excess of cement needed with an easily available aggregate of medium quality than to import a better aggregate. The selected materials are mixed in a suitable batch-mixer for at least a minute, placed in the forms as quickly as possible, in such a manner as not to separate the ingredients, and the concrete thoroughly compacted in the forms.

Should anyone judge from the foregoing that concrete work is too complicated to be attempted by the architect so long as other building materials are available, he has but to look about him to realize the fallacy of such an assumption. On the other hand, should the architect gain the impression that in the absence of time to study the subject thoroughly himself he should choose with great care experienced contractors to build his work and skilled engineers to advise him on its design,—he has then reached a commendable conclusion.

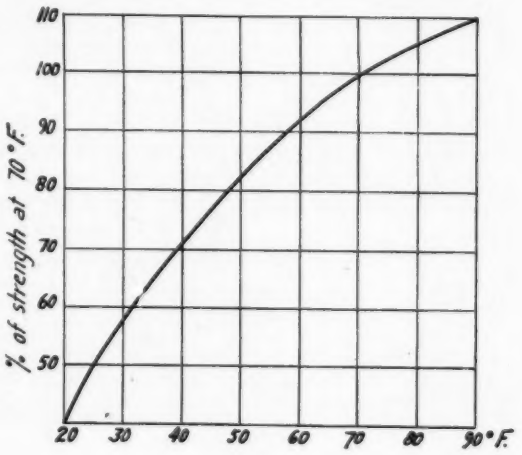


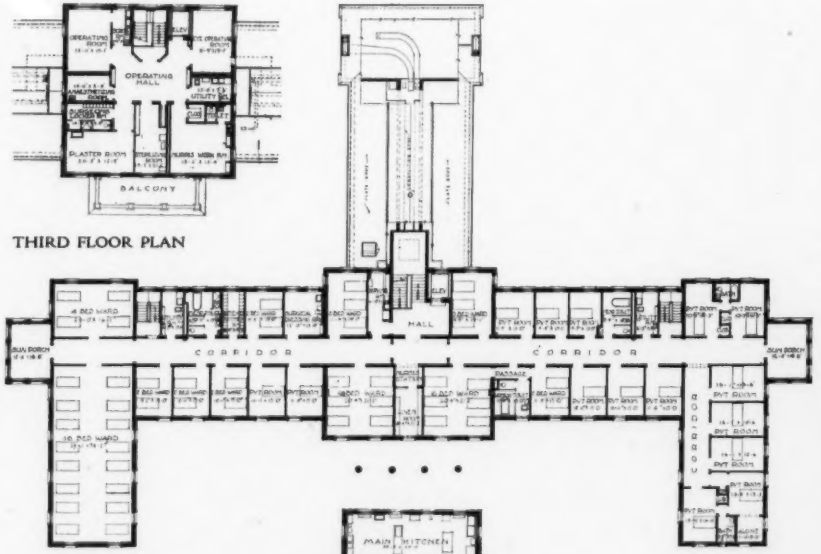
Fig. 5

GENERAL VIEW

HOSPITAL FOR THE ILLINOIS CENTRAL RAILROAD COMPANY, PADUCAH, KY

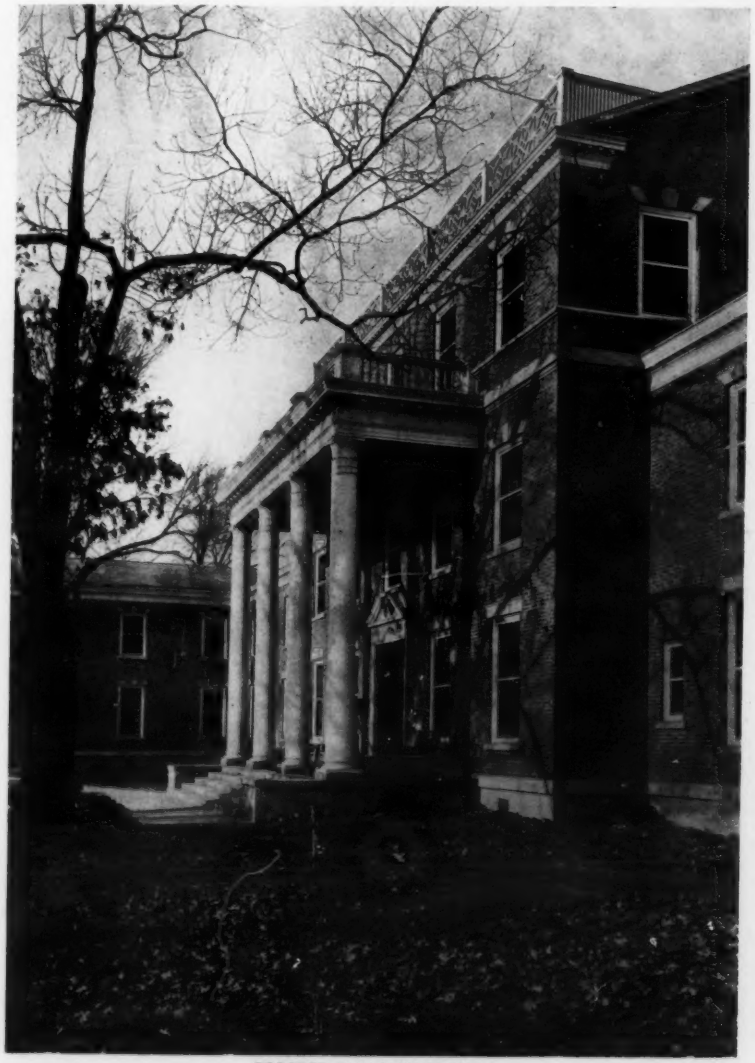
RICHARD E. SCHMIDT, GARDEN & MARTIN, ARCHITECTS

THIRD FLOOR PLAN



SECOND FLOOR PLAN

FIRST FLOOR PLAN



PORTICO ON MAIN FRONT

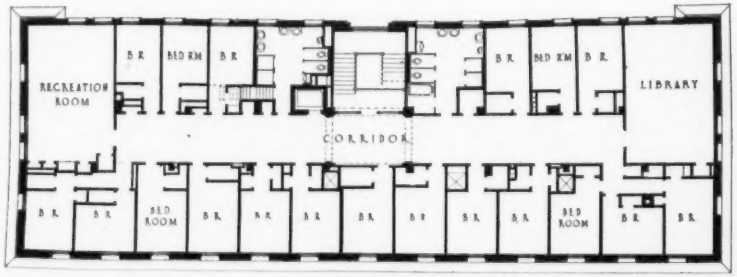
HOSPITAL FOR THE ILLINOIS CENTRAL RAILROAD COMPANY, PADUCAH, KY.

RICHARD E. SCHMIDT, GARDEN & MARTIN, ARCHITECTS

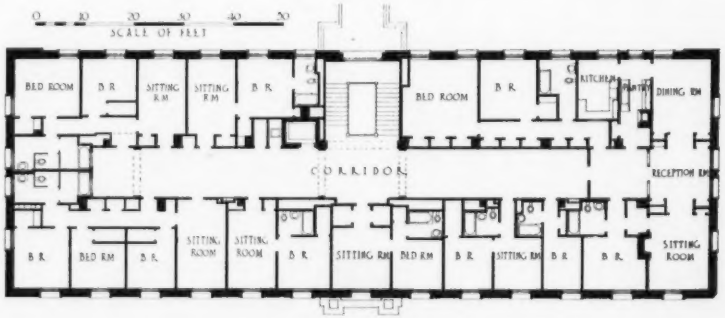
GENERAL VIEW

ADMINISTRATION BUILDING, NEW HAVEN HOSPITAL, NEW HAVEN, CONN.

L. W ROBINSON, ARCHITECT; DAY & KLAUDER, ASSOCIATE ARCHITECTS



THIRD FLOOR PLAN



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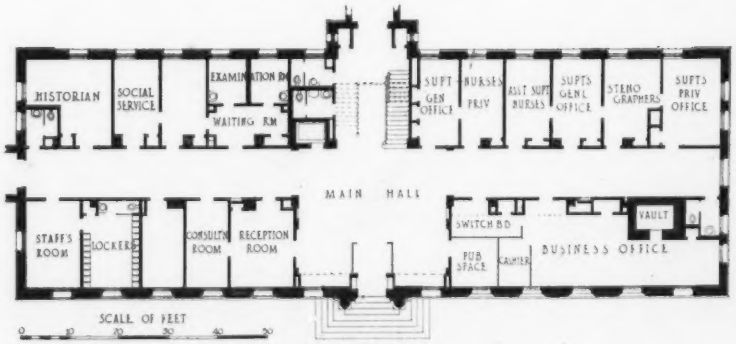
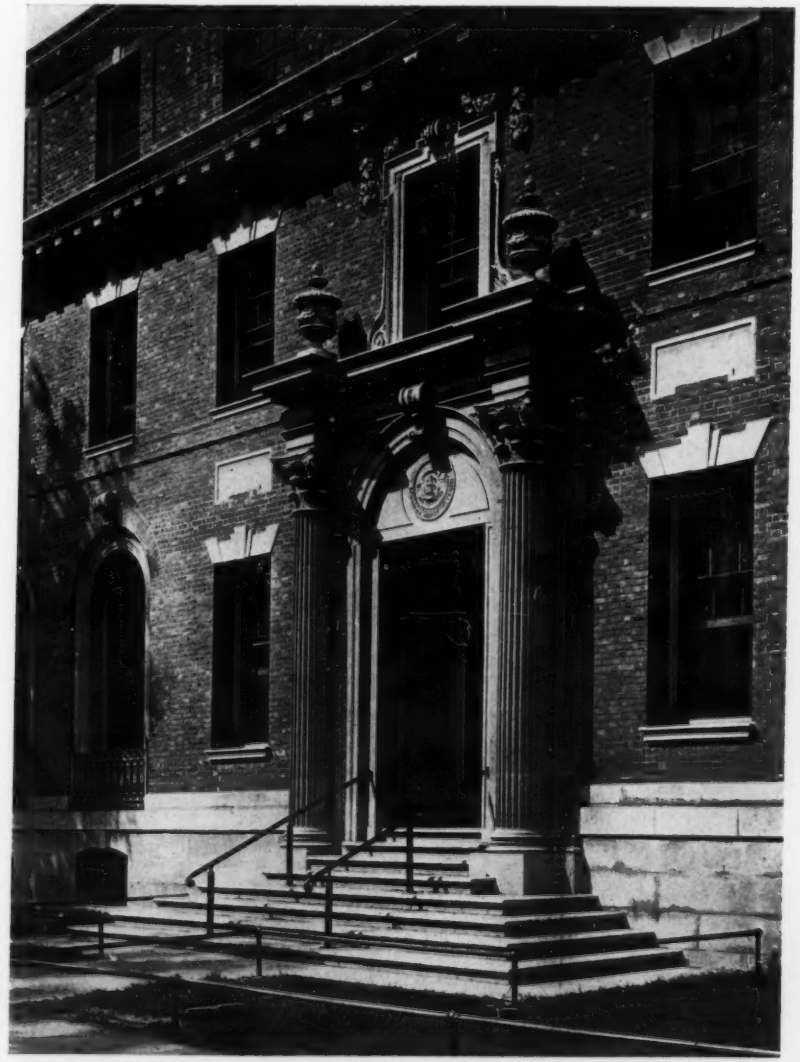


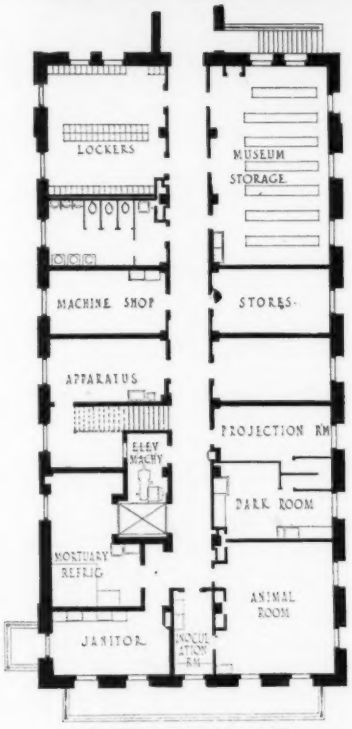
FIRST FLOOR PLAN



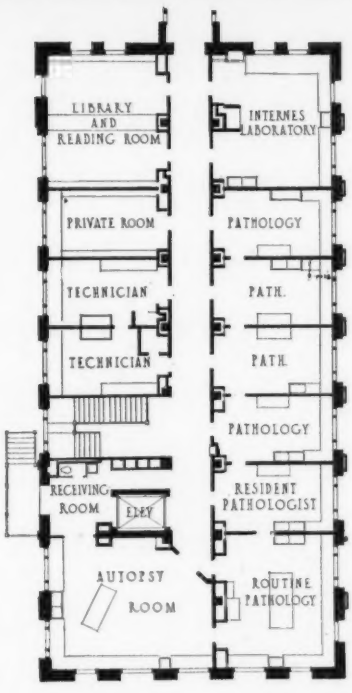
MAIN ENTRANCE

ADMINISTRATION BUILDING, NEW HAVEN HOSPITAL, NEW HAVEN, CONN.

L. W. ROBINSON, ARCHITECT; DAY & KLAUDER, ASSOCIATE ARCHITECTS



BASEMENT FLOOR PLAN



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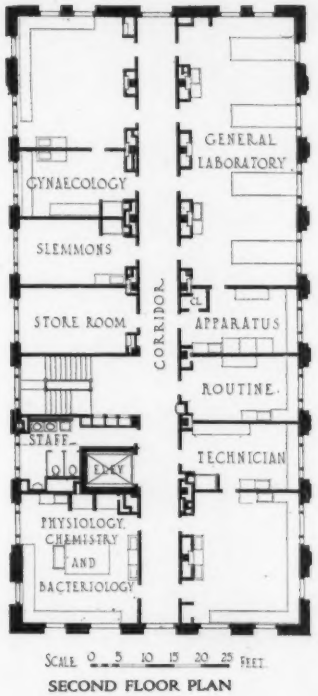
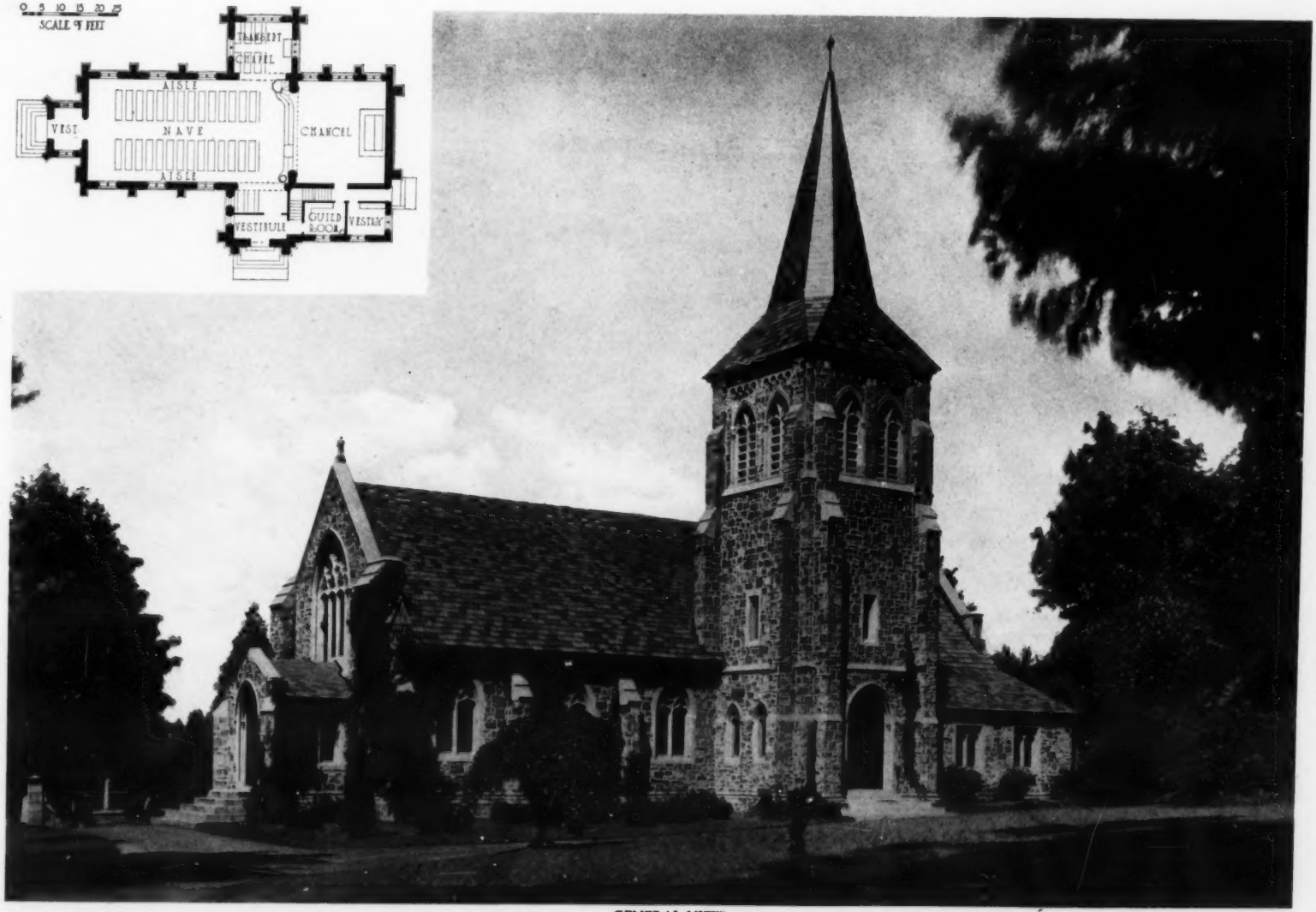


SECOND FLOOR PLAN

ANTHONY N. BRADY MEMORIAL LABORATORY, NEW HAVEN HOSPITAL, NEW HAVEN, CONN.

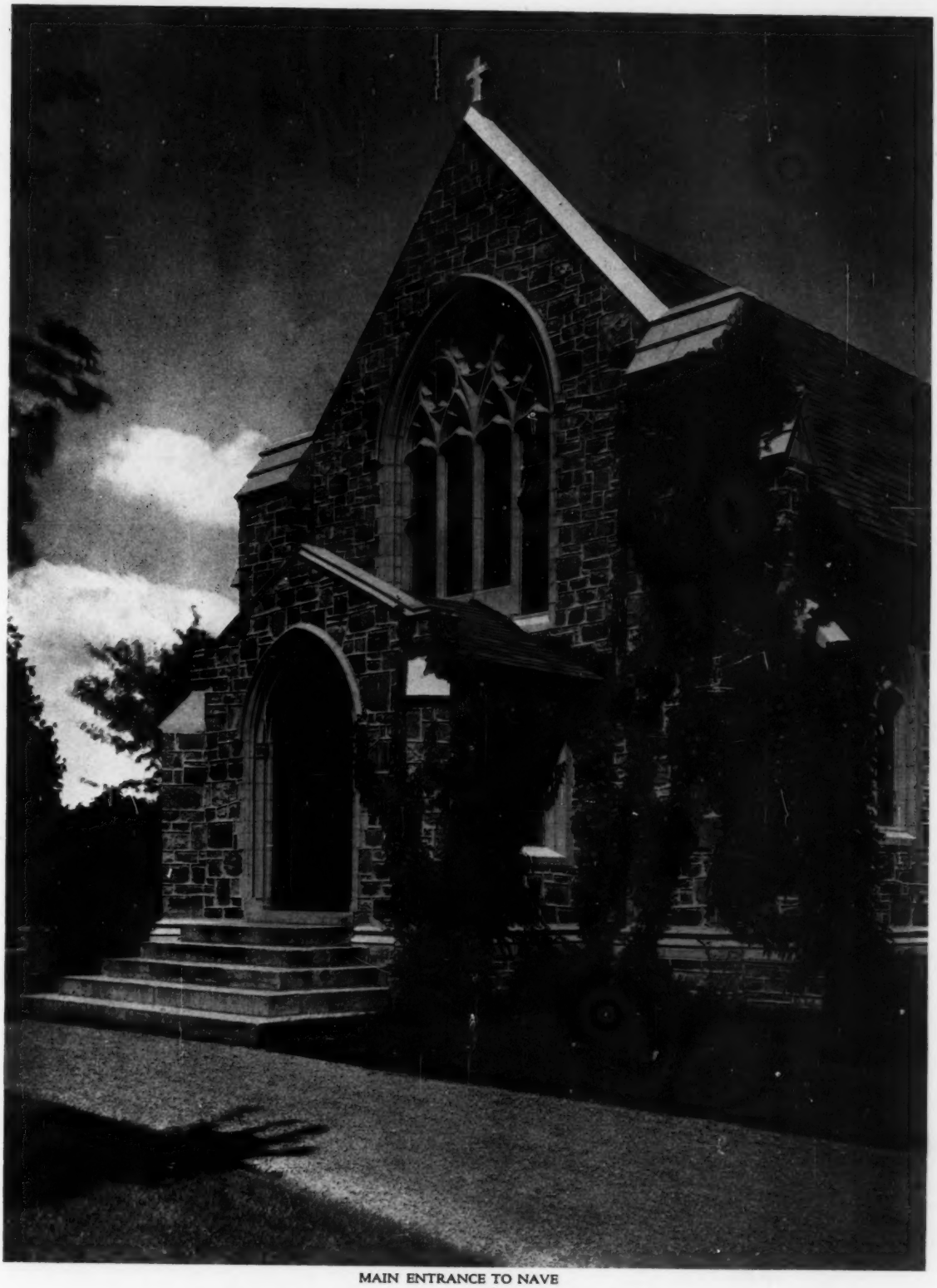
L. W. ROBINSON, ARCHITECT; DAY & KLAUDER, ASSOCIATE ARCHITECTS



GENERAL VIEW

ST. JOHN'S EPISCOPAL CHURCH, WASHINGTON, CONN.

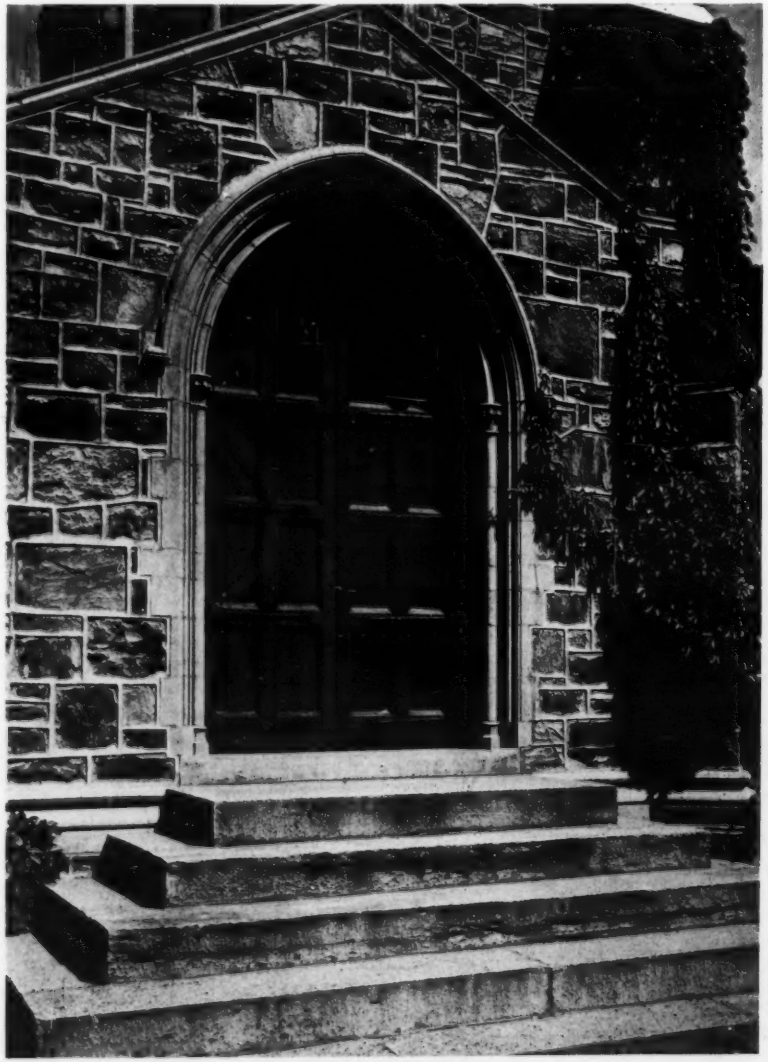
ROSSITER & MULLER, ARCHITECTS



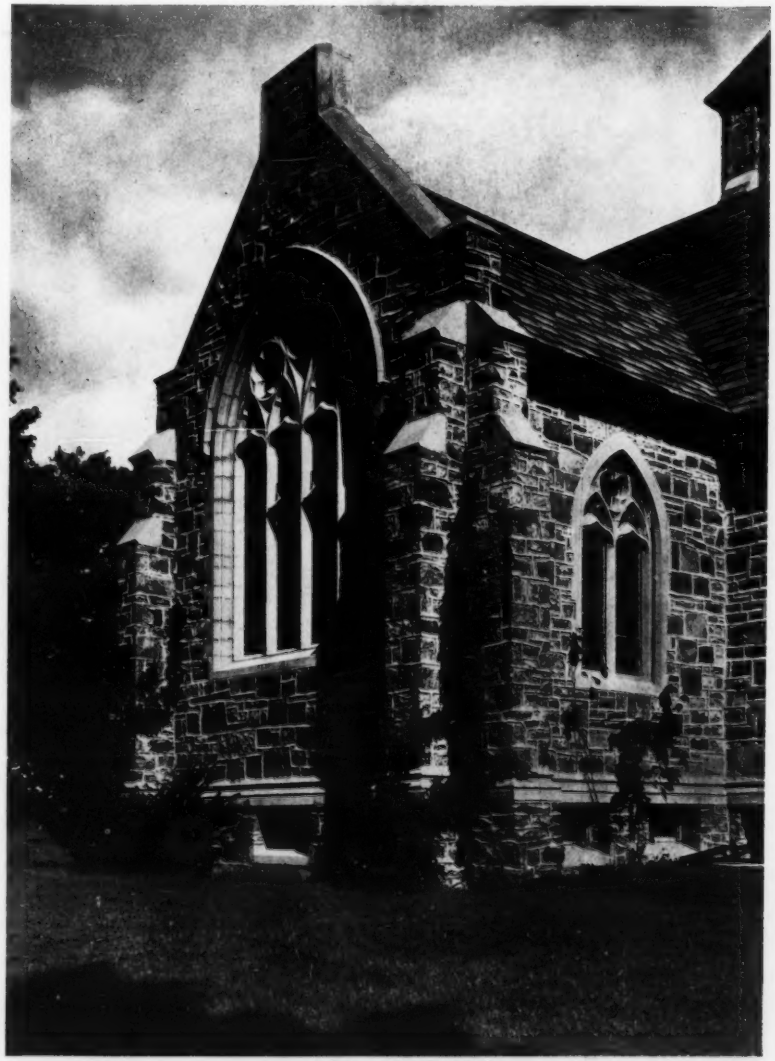
MAIN ENTRANCE TO NAVE

ST JOHN'S EPISCOPAL CHURCH, WASHINGTON, CONN.

ROSSITER & MULLER, ARCHITECTS



MAIN DOOR DETAIL



DETAIL OF TRANSEPT

ST. JOHN'S EPISCOPAL CHURCH, WASHINGTON, CONN

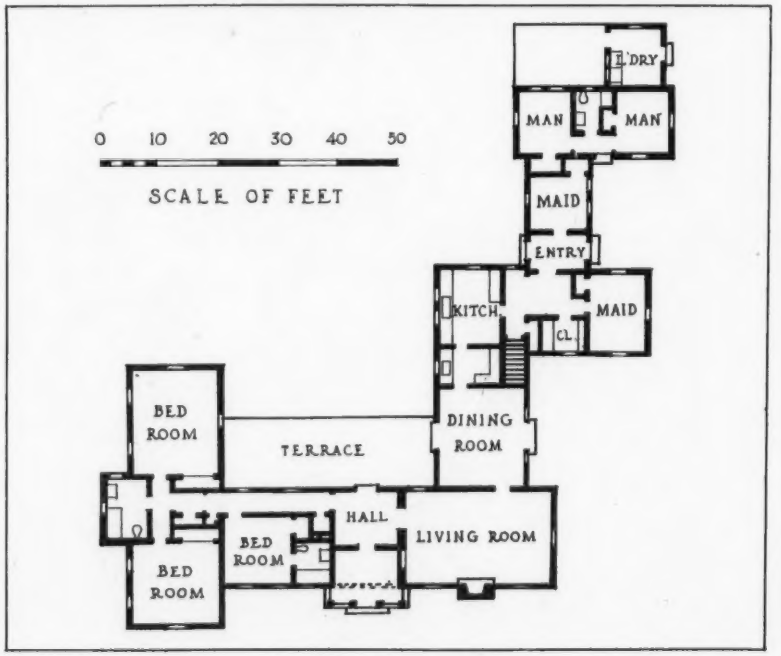
ROSSITER & MÜLLER, ARCHITECTS

DETAIL FROM DRIVE

ENTRANCE FRONT

HOUSE OF ARTHUR K. BOURNE, ESQ., PASADENA, CALIF

JOHNSON, KAUFMANN & COATE, ARCHITECTS



GROUND FLOOR PLAN

TERRACE DOORWAY

HOUSE OF ARTHUR K. BOURNE, ESQ., PASADENA, CALIF

JOHNSON, KAUFMANN & COATE, ARCHITECTS

The Boston Architectural Club

MORE than a little suggesting the guilds of the mediæval ages is the organization which has its home at 16 Somerset street, Boston, over the entrance to which are the words "Boston Architectural Club." Formed to draw together all the men, whether draftsmen or master architects, who work together in this most noble of the arts, it gathers into its fellowship for mutual encouragement and help the eminent among Boston architects, who have already "arrived," and the junior draftsmen who are "on the way," all of which is to say that the Club exists for the purpose of associating those interested in the profession of architecture with a view to mutual encouragement and help in study.

The Club came into existence in 1889. Its early years were full of vicissitudes, alternating ups and downs, and migrations from place to place. The greatest red letter day in the history of the Club was the time in 1910 when possession was taken of several old structures on Somerset street, near the summit of Beacon Hill. Here was presented an interesting opportunity for redeeming and adapting worn and spiritless buildings to the interesting uses of a club with a distinctly architectural aim. It has been a hard struggle, and it is not ended yet, but today, after many years of effort, the results are reassuring and its value is now widely recognized.

Upon this byway in the very heart of the older section of Boston, a small doorway with a dark, quaint door opens directly from the sidewalk into a dingy vestibule. A few steps lead down to a gallery which runs along the end of a large, dimly lighted banquet hall. From the end of the gallery more steps lead down to the tiled pavement of the hall. At the farther end of the hall is a group of leaded windows divided by stone mullions. At one side is a huge hooded fireplace and on the other a narrow stair ascending to a casemented kitchen. Everything in sight is only half in sight, because of the dimness and the faint haze resulting from many pipes and an occasional puff from the great logs glowing on the andirons. The deep shadows, the haze and the dark purple curtains encourage relations among those members who have just finished luncheon. Some draw up chairs around the embers of the fire, lighting their pipes or cigarettes with a live coal held in the fire tongs—part of the club ritual. Some are leaning over the heavy black oak table engaged in the earnest discussion of an "ethic." Three or four scrutinize the "exhibition"—a row of etchings, sketches or paintings hung on the north wall. One is feeling out a new air on the piano. The chef stacks the plates and disappears with them

Great Hall of the Boston Architectural Club

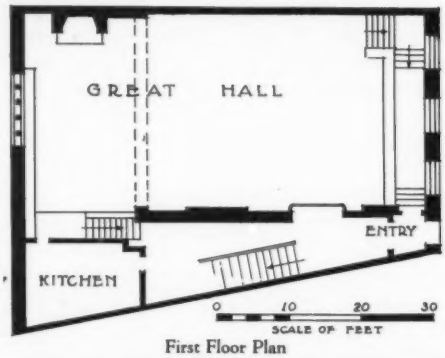
The Cheering Fireplace in the Great Hall

up the narrow stairs. Soon pewter plates are expected to arrive from England. Under the balcony architects are engaged in a spirited fencing match, reminiscent of their days in Paris. The balcony underneath which they fence commemorates the visit of Leonard Stokes, president of the Royal Institute of British Architects, to the Club some years ago.

At night the sconces are lighted, and the tallow drips down from the wooden rings upon which the candles are fixed. There is revelry on winter nights. The fire is almost boisterous too, and bowls of incense swing from the shadow of the heavily beamed ceiling. The members throng floor and galleries, clad in gaily colored dominoes. There is much mirth, strung upon some slender thread of a play or "masque," and there is always the Club song.

Upstairs is the reading room with tables, lamps and magazines, another piano and some "fireplace registers." The well loved volumes of Letarouillit and Pugin and the rest may be studied with as little interruption as came to the Benedictines. Upstairs again is the "lecture room," so called, with a portable blackboard for classes in mathematics, structures, shades and shadows, perspective and estimating. There is also a room where "Rufus" lives. He takes care of the Club after his regular work elsewhere. Once more upstairs, and we come to the heart of it all—the "Atelier"—a small regiment of old drafting tables huddled underneath quaint, blackened rafters which support myriad drop lights—low walls of brick, frescoed with a weird allegory, "The Egg of Originality is Bunk." This Atelier is a self-governing body. Boys whose days are perforce occupied with office work, put in evening after evening on the same problems as certain other institutions, and often with criticisms by the faculty member of Tech or Harvard. The results have been encouraging in the extreme. The Club has won a place. It has *esprit de corps*.

Not slow to perceive the advantages of alliance with



First Floor Plan

The Balcony with Iron and Wood Craftsmanship

other bodies of men who might be students of architecture, the directors of the Club, jointly with the educational committee, in 1914 achieved a union with Harvard University and with the Massachusetts Institute of Technology, in such manner as to secure to the Club the privilege of exhibiting with these institutions their work in design, and of assignment of joint problems. Year after year since that time the walls of the exhibition room have displayed the work of the younger men and boys of the Club—fellows obliged to work in offices all day, but eagerly availing themselves of the evening classes at the Club for their further education—side by side with drawings by the students of Harvard and Technology, and the Club work has stood the test creditably.

While the affairs of the Club were progressing, as here described, in a gratifying manner, the great war broke out, and threw everything into confusion. How did the Club respond? A few months after the entrance of our country into the war every man in the Boston Architectural Club, not incapacitated by age or disability, was enrolled in the service of his country. The Atelier closed its doors and gave its last man to the service. During the months that followed death claimed three of its members,—Gordon Kellar, George MacElligott and Wilfred O'Connor. As a lasting memorial of these men, the entire membership of the Club and its friends have erected a library, connected with the Club building.

Detail of the Fireplace in the Memorial Library

This library was dedicated in May, 1922, with impressive ceremonies. Among the speakers was General Edwards, representing, as an army official, the three men to whose memory the library is dedicated. President H. H. Kendall of the American Institute of Architects, C. Howard Walker and President Niels H. Larsen of the Club also took part in the dedication. It is one of the largest and finest architectural libraries in the country. Through a committee of the Atelier a fund of nearly $10,000 was contributed by members and friends of the Club, and the present library was erected, under the supervision of Bellows & Aldrich, architects, assisted by other friends. On the shelves today are the libraries of Robert S. Peabody, Charles Brigham and William Gibbons Preston, as well as that of the Club itself, which was a good collection even before Mrs. Peabody added her late husband's books, and Mr. Brigham his. The arrangement of the books has been the work of Robert P. Bellows, a nephew of Mr. Peabody, and a member of the firm that designed the library.

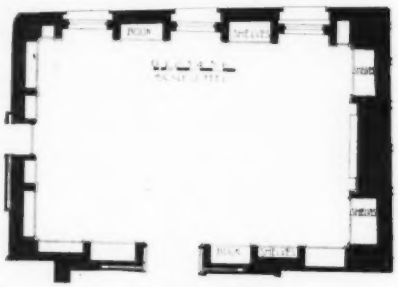
The whole community will feel that this group of architects and their assistants, constituting the Club, has done impressive and fitting honor to those of its number lost in the great war. Today the Club is experiencing a strong "come back," and among many new undertakings has established with the Boston Society of Architects a joint standing committee for the adjudication of matters in dispute between architects and their men, and the general bettering of relations between these two bodies—master and apprentice—in the profession. The committee is undertaking to strengthen the solidarity of the profession—to stand for those ideals of mutual confidence and fellowship among all engaged in it, which animated the famous guilds of the middle ages. A movement is under way, with promise of success, for the joint use of the club house by the Boston Architectural Club and the Boston Society of Architects, members of both

organizations having voted in its favor. This, with the enlargements in view, would give the architects of Boston a center of great value as a symbol of their importance in the community.

Members need not be architects, present or prospective. Kindred spirits are welcomed among the habitués of the "hall." The craftsman, sculptor, painter, musician, and even the minister, contribute to the daily disputations. When a fortunate member returns from Bermuda or Brazil his water colors are forthwith demanded of him and hung under the tapestries for all to see. Every year there is a grand exhibition of the notable work of the twelvemonth. Each season, too, a book is published, compiled by the members, and containing material concerning some phase of the profession's activities, measured drawings, rare photographs, etchings or descriptive material of one kind or another which is apt to be of general interest.

The Club's activities do not all come under its wonderful old roof; for many years its "excursions" have been the envy of all who could not share them. Visits *en masse* to the famous iron forges of Koralewsky and to Kirchmayer's wood carving shop, to brick yards, stone yards, lumber yards and navy yards, iron works, power plants and finish shops were interspersed with outings to the famous old hostelries and historical shrines of Plymouth, Salem and other cities of eastern Massachusetts. Not content with that, a vast throng made a pilgrimage to Providence and were piloted through its distinguished capitol and famous university. Wishing more worlds to conquer, the throng next found itself gazing heavenward at the higher miracles of lower Broadway, examining the secret panels of the Morgan Library on 36th street, and lost in the vastness of the Pennsylvania Concourse and the kitchens of the Biltmore. Then came the great crusade. Washington was visited in a body, and its many wonders noted. It is not beyond the possibilities of this group of earnest investigators to carry their field-visits, in these dry days, to Quebec and Montreal.

Meanwhile, and in spite of their vagrancy, they are always "at home" at 16 Somerset street to all loyal friends of the great profession who may find themselves in Boston. There you may break bread with them if you will, and join in the fellowship of the "Draftsman's Guild." The best of life is fellowship in a common quest; nothing can rival the devotion of a band of like-minded men to a great work. To the glow of the struggle is added the reassurance of support and sympathy, and the intimacy of such comradeship is the quintessence of life. Such a fellowship has crowned the efforts of a generation of loyal devotion on the part of Boston architects and draftsmen, and the Club is its symbol.



Floor Plan of Library

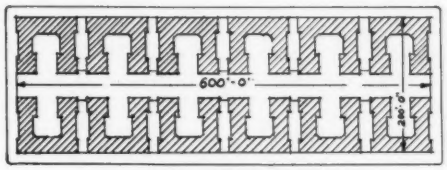
New Memorial Library, Boston Architectural Club

A Mammoth New York Housing Operation

METROPOLITAN LIFE INSURANCE COMPANY BUILDS FIFTY TENEMENT HOUSES

ANDREW J. THOMAS AND D. EVERETT WAID, ASSOCIATE ARCHITECTS

HOUSING shortage has been a serious problem for a long time in New York, and due to public interest in the subject state legislation to relieve immediate conditions has recently been enacted. One of the new laws enables insurance companies to invest amounts up to 10 per cent of their assets in housing. The Metropolitan Life Insurance Company, long actively interested in building loans, has in accordance with the new legislation this month let contracts for the construction of the first portion of a group of low-cost apartment houses that may possibly involve ultimately an expenditure of $100,000,000. The requirements which had to be met before this work could go ahead were that the buildings should be built at a cost permitting a return of 5½ per cent on the investment, to be realized from rentals of $9 per room per month, including service of steam heat, hot water and electricity. This has been accomplished, and in addition a type of house has been planned that marks a great advance over previous city housing in the provision of light, air and sunshine.



Typical Block Plan

The architects of this work are Andrew J. Thomas and D. Everett Waid, associated, and the plans show the complete application of the theory

Andrew J. Thomas and D. Everett Waid, Associate Architects

Ground Floor Plan

Typical Floor Plan

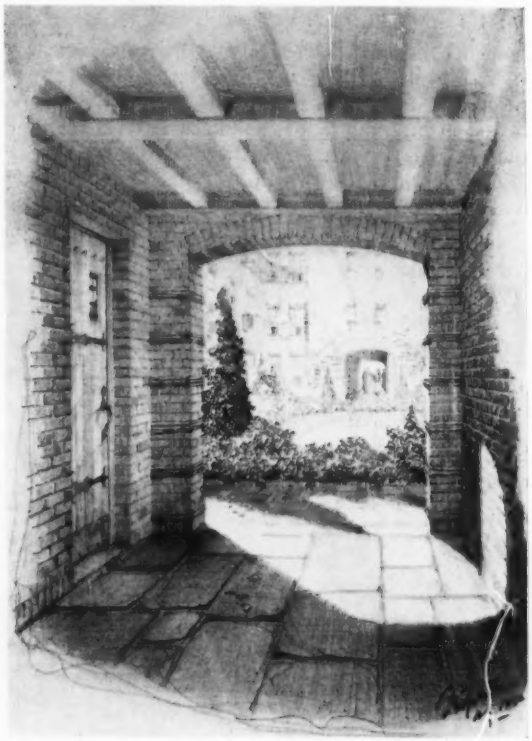
of tenement house planning developed by Mr. Thomas through years of study. This has been fully explained in previous issues of THE FORUM* and may briefly be described with the statement that it is possible to achieve the same percentage return on a building which covers but 50 per cent of the plot as in a building complying with the legal limit of 70 per cent. The land that is thus freed provides large openings through the block in each direction and produces what Mr. Thomas calls "block circulation." In addition to the greater amount of ventilation provided, the rooms of the individual apartments are larger than the minimum legal requirements and, furthermore, care has been taken to provide separate kitchens, living rooms and small dining alcoves—features that previously have not been afforded in tenements, but which are highly desirable as aids in raising living standards. The insurance company has likewise shown its forethought in restricting the minimum number of rooms in most apartments to four, with the thought that a smaller number of rooms is incompatible with American conditions.

The chief economy that makes Mr. Thomas' theory workable is found in the plan of the building itself—the entire elimination of non-rentable space in the form of public corridors. Due also to the large size of the operation it has been possible to expend every thought on the plan of the one house which will be repeated many times. The vastness of the scale of this operation is indicated by the fact that it comprises 50 detached buildings, each of which is intended to house 39 families, a total of 1,950 families occupying 8,250 rooms. The buildings are arranged in blocks with 12 individual houses comprising a block, each five stories and basement high and in the form of a letter U, the solid ends facing the streets and open ends facing into an inner court or garden 36 feet wide and 600 feet long—the entire length of the block. This area is increased by the addition of the individual courts belonging to the 12 separate buildings and the 15-foot courts between buildings. The fire escapes are located in these side courts, thus freeing the fronts of the buildings of a feature that always defeats any attempt at architecture.

These buildings are being built under specifications developed through the long experience of the architectural department of the Metropolitan Life Insurance Company, which applies a system of structural standards and requirements to all building plans on which mortgage loans are made. Construction of the buildings will likewise be directly under its regular inspection system.

* June, 1919; April, 1922.

View of Rear Court with Garden Treatment



One of the Simple Entrance Loggias

ENGINEERING DEPARTMENT

Charles A. Whittemore, *Associate Editor*

Electrical Wiring Layouts for Modern Buildings

PART VII. OFFICE BUILDINGS

By NELSON C. ROSS, *Associate Member, A.I.E.E.*

THE circuit wiring of a modern office building must be designed not only to care for the building requirements, but must also be proportioned so as to permit of reasonable changes and additions to the wiring circuits from time to time to meet the needs of tenants.

When the wiring layout is made the offices, shops, etc., are not as a rule rented, nor is there any knowledge of the special requirements of the tenants or of the business to be conducted in the stores and shops. Outlets therefore must be so located that they will not only cover average requirements, but will permit of reasonable extension of the circuits with the least possible expense or mutilation of the walls and finish. Further, it is necessary on this type of building to make the feeder copper heavier than would be considered necessary if the ultimate load and demand were known, as spare feeder capacity should be provided to care for the possible addition of motors, electrical heating, display lighting, etc., as the rented spaces are developed. Special attention must also be given to the division of the feeder circuits and mains so that the service may be properly metered, both for the current used for general illumination and power, as well as the current delivered to each tenant.

Provision should be made in the wiring layout to care for:

1. Power for general use, as for elevator machines, ventilating motors, pumping equipment, etc.
2. Power service for the use of tenants, metered separately.
3. Lighting service for owner's use, including lighting of corridors, general toilets, entrances, public rooms, etc.
4. Lighting service for the use of tenants, metered separately.
5. Telephone service, general to the building.
6. Private telephone service, if required.
7. Telegraph messenger service.
8. Watchman's clock circuit and equipment.
9. Fire alarm circuit and equipment.
10. Protective equipment with outside service.
11. Door bells and signals.
12. Provision for private power and lighting plant, if desired.
13. Interior signals, if required.
14. Provision for radio equipment, if necessary.

SYSTEM OF WIRING, METERING, ETC.—Office buildings may be of first or of second class construction, and on smaller buildings even of third class construction, and while it is obvious that full conduit work must be used for all circuits on first class buildings, structures of second or of third class construction may be wired with conduits, B. X. armored wires, or (locality permitting) even with concealed knob and tube work.

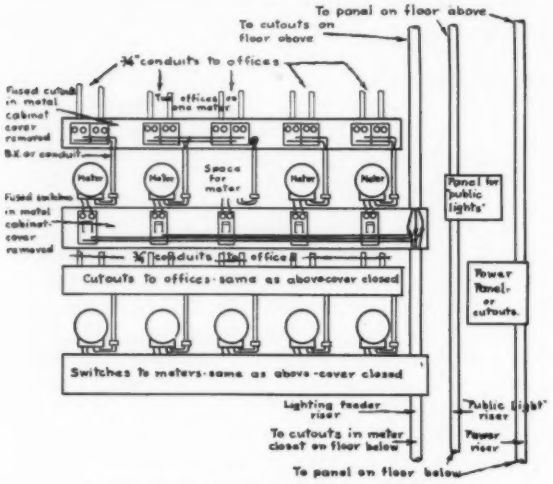
While the installation cost of B. X. armored wire or of knob and tube work will prove less than the cost of conduits, nevertheless the use of conduits for office building wiring will prove cheaper in the end, as changes are always being made in the wiring of the offices to care for requirements of new tenants. With conduit work properly installed and proportioned for this work, the circuits may be withdrawn and larger wires or additional circuits added at any time, and this at small expense compared with the cost of like additions on the other systems, or even with the cost of exposed work under metal. While the use of exposed wiring in conduits or metal mouldings, etc., is satisfactory from the standpoint of safety and convenience and may well be used for short runouts of the branch circuits, any amount of exposed work of any type cannot but detract from the appearance of the finished offices, will act as a collector of dust, and will not be as satisfactory as concealed wiring.

In general, the wiring circuits of a building become a network from the point of the service to the panel-boards and distributing centers, and from the distributing centers to each and every circuit and outlet connected with the system, each circuit in proper relation to the whole. In an office building, however, there may be not one but several networks, each being independent of the others and yet so arranged that any and all may be interconnected if desired for metering and control.

The public lighting for the corridors, general toilets, elevators, building entrance, marquise, electric signs, etc., must be metered and controlled apart from the lighting service supplying the offices, etc., while likewise the power used by the building is metered and controlled independently of the power service supplying the tenants. Few office buildings are now erected solely for office purposes, as the street floors and at times even the second and third floors will be developed as stores and shops, and these again must be separately controlled and metered for both power and lighting service.

Certain of the larger office buildings may have

their own private lighting and power plants, used to manufacture current in conjunction with the steam heating system, the exhaust steam from the engines being used for heating during the winter months and for the heating of water during the summer. The plants may be used to manufacture all of the current used by the buildings, or may manufacture but a part of the current used, the remainder being purchased from the local service


To panel on floor above
To cutouts on floor above
¾" conduits to offices
Two offices on one meter
Fused cutouts in metal cabinet cover removed
B.X or conduit
Meter
Space for meter
Panel for public lights
¾" conduits to offices
Cutouts to offices-same as above-cover closed
Power Panel or cutouts
Switches to meters-same as above-cover closed
Lighting feeder riser
Public light riser
To cutouts in meter closet on floor below
Power riser
To panel on floor below

Arrangement of Meters and Cutouts in Meter Closets of Building

company. When this is done a breakdown service or overthrow switch is installed in the engine room, the center poles connected to the feeder buss bars of the switchboard and the outer connections to the generator and to the service lines, thus permitting the building to be served from either the outside lines or from the local generators at will.

While with the use of a central lighting and power plant it would be possible to deliver current to the tenants either at a flat rate per month or to include the lighting and power service as a part of the rental of the office, etc., this as a rule will prove unsatisfactory, as it will be impossible to regulate the amount of current that each tenant will use, and the general use of high power lamps, electric radiators, fans and other equipment may overload the circuits and prove a source of considerable loss. As a result it has been found advisable to meter all current used, whether this is supplied from a private plant in the building or by the service company.

Like all other commodities, electric service is sold at what may be termed wholesale and retail rates, and the cost per kw. hour becomes less as the number of kw. hours used per month increases; thus, if all of the current used by an office building were sold through one meter, the service company having no responsibility for the distribution or metering of this current on the building side of the meter, the rate would be less per kw. hour than would be the case if the same amount of current were sold to 100 tenants through 100 meters, as in the latter case the service company must furnish the meters, keep them calibrated and in repair, see that the meters are read and bills presented each month, as well as carry the separate accounts.

Many owners take advantage of this wholesale, or what is more accurately termed "re-sale," rate. They purchase the current through one meter and then resell to the tenants at the same rate that the tenant would be charged by the service company. If this is done, the owners must purchase the individual meters, must see to the reading of the meters and the collecting of the bills. The difference between the re-sale and the wholesale rate is retained by the owners. The supervision of the service, however, the collecting of the bills, etc., entail more or less work and annoyance, and certain owners prefer that the tenants deal directly with the service company; again, in certain cities and towns the service company will not make a favorable re-sale rate to the owner, the company preferring to deal directly with the tenants; in either case the tenant is served through one meter, and it becomes necessary that wiring be arranged so that all current used by any tenant may be registered on one meter.

The circuits must also be arranged so that one or any number of offices may be served through one meter, as it is obvious that the occupant of a suite of offices served by one meter will obtain a better rate than would be the case if several meters were used to register the current.

The older practice covered the installation of a meter in each individual office, the cutouts being located in each office, and a horizontal conduit connecting all cutout boxes on each floor. In this way one or several offices could be connected to register on one meter, as inter-connecting wires could be drawn into the horizontal conduit permitting this to be done. This, however, has not proved satisfactory and in many cities it will not now be permitted under the local rules.

Under present conditions it is best to provide a separate meter room or meter closet on each floor, and to run all lighting circuits from each office direct to this meter closet, the circuits terminating in fused cutouts. All circuits for the general lighting of each of the floors are also carried back to and terminate in cutouts in the meter closet. The meters are installed in the closet, and it is a simple matter to group any number of the cutouts and circuits on one or more meters, permitting the offices to be metered either singly or in a group.

In the larger buildings, and where the lighting circuits from the offices average more than 80 feet in length, two or more meter closets should be provided on each floor, each closet to control the circuits covering a certain zone with an average length of the circuits not exceeding 80 feet. If it becomes necessary to run circuits 100 feet or more in length, the wires used on these circuits should be No. 12 B. & S. gauge in the place of the No. 14

wire as commonly used, while if like circuits are carrying from 1000 to 1320 watts, not less than No. 10 wire should be used, the larger wire compensating for the increased resistance due to the length of the circuit.

For a smaller building it is sometimes good practice to locate the meter room in the basement and to carry all circuits from the offices down and terminating in cutouts in this meter room. This is common practice in apartment hotels as it permits the meter reader to read all meters without entering the apartments. The stores or shops on the upper floors may also be metered from a closet on the respective floors, while with the stores on the first floor the meter is best located in each store basement, as the stores are as a rule heavily circuited to care for general illumination, display lighting, window lighting, electric signs, etc., and it is less expensive to locate the meters in the basements than to run all of the circuits back to a meter closet on one of the upper floors. Again, with the meter in the basement the full control of the circuits is within the store and fuses may be replaced without the necessity of entering the office building.

The public circuits on each floor are carried back to the respective meter closets and are terminated in cutouts. These cutouts, however, are connected on the public riser circuit, there being one meter installed. This as a rule is located in the basement. All power circuits for control of building motors, as for elevators, ventilating fans, pumping equipment, etc., are as a rule metered at the point of the entering service, a master switch at this point controlling the building power riser or feeder cables, all motors throughout the building being connected through proper cutouts to feed from this riser. This will give satisfactory results.

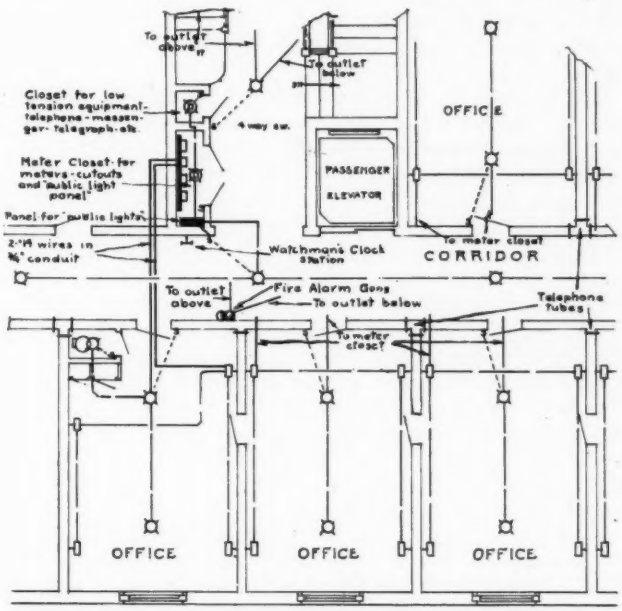
Where power is required for the tenants, a separate riser is carried from the point of service, the riser passing up through the meter closets and branch cutouts being located in each closet permitting branch power circuits to be carried from the meter closet to the offices or shops, the meter in each case being located at the junction.

WIRING OF OFFICES. In the lighting of the offices provision must be made for general illumination, for the lighting of desks, for the use of electric fans and portable equipment, and for the use of motor-driven office machines. Where a furniture layout is available the lighting outlets may be accurately located with reference to the furniture. As a rule, however, no furniture layout can be obtained, and the outlets must be so placed that they will best meet average requirements. It is good practice to provide one ceiling outlet for general illumination of the smaller offices, with two or more ceiling outlets for the larger offices, these controlled from several switches at the entering door.

In general offices or accounting rooms, where a large number of desks may be used, it is well to provide a number of ceiling outlets, spacing these uniformly an average distance of 12 feet apart and 5 or 6 feet from each wall. This will give good average illumination without the use of individual lights on the desks. Private toilets may be lighted either by means of ceiling fixtures or by means of bracket fixtures located at the left of the mirrors; the lighting of the toilet should in all cases be controlled from a switch at the entering door.

Provision may be made for the lighting of the desks either by means of bracket fixtures or by means of wall receptacles. Of the two, for office work the receptacles are to be preferred, as they allow more or less leeway in the locating of the desks, and when the receptacles are set in the baseboard the wall space is left clear. Double receptacle outlets may be used in these locations, and these will provide also for the use of wall or desk fans or for two or more portable fixtures.

A fitting which is now being made by several of the manufacturing companies is standardized and consists of a special type of flush receptacle. It is intended to be mounted in a standard switch box and at the general bracket height of 6 feet, 6 inches. These receptacles are set flush with the wall and permit the use of any standard receptacle plug. They are also furnished with a special plug which is designed for mounting on the stem of a bracket fixture, the circuit wires terminating in the binding screws of the plug, thus making a self-contained unit. The brackets are then simply plugged into



Typical Floor Layout of Average Office Building Showing Meter Closets, Corridor and Office Arrangement

the receptacle and are held rigidly in place by means of a catch. With the use of this fitting, it becomes possible to make use of bracket fixtures or portable equipment from any plug at will, or to remove and replace bracket fixtures, or to interchange the fixtures in the office, this being done without tools of any kind and with no more effort than is required to shove the fixture into place. These fittings may be used also for ceiling outlets, and their general use would permit the tenants to own their lighting fixtures, to remove and replace the fixtures for cleaning, or to change the type of fixture at any time without the necessity of calling in an electrician.

Where offices are to be fitted with baseboard receptacles it is well to provide four receptacles for each office, and where the office is located on the second or even the third floor, it is well to provide an additional receptacle, this located at a point near the window to permit the possible use of window signs. All receptacle outlets should be connected to circuits separate from the ceiling illumination; thus in the event of one fuse blowing and opening the circuit, the offices will still have light from the receptacles.

Outlets in different offices should not be connected to the same circuit, as each office should be metered separately. The conduits from each office to the meter closets should be not less than ¾ inch, even if but one circuit is required, as this provides spare conduit capacity in the event of additional circuits being required in the future.

Entrance and Stair Halls, Etc.—The entrance lobby and vestibule may be lighted by means of indirect lighting with the units concealed in coves, or by means of ceiling pendants. If cove lighting is to be used, it is important that the cove be properly designed so that the ceiling may be evenly lighted.

All lighting of the entrance lobby, vestibule, marquise, stair halls, elevator cars, etc., as well as the lighting of electric display signs should be controlled from some point near the entrance or in the first floor corridor, all circuits from the lighting outlets being carried back and controlling from a panel-board. If the office of the superintendent or janitor is to be near the entrance lobby, the panel-board may be installed in this office, and thus the control of the public lighting be put under the superintendent or janitor. Furthermore, the riser circuits feeding the public lighting of the upper floors may be mastered by switches on this panel-board, the riser circuits passing through the panel-board and thence connecting to the public cut-outs in the meter closets. In addition, however, the public lighting of the different floors should be controlled by local push-button switches, these set at the entering doors of the toilets and general rooms and at a point near the elevator for the corridor lighting, and corridor lighting should be controlled on two circuits, each circuit feeding one-half of the illumination of the corridor. The switches may be of the push-button type or of the lock type in which a key must be used for the operation of the switch; this permits the mastering of the corridor circuits from the panel-board in the office, and the individual control of the lighting by the janitor or by the elevator operator as required.

Where red lamps or exit signs are used at the doors entering the stair wells, or elsewhere throughout the building corridors, the circuits connecting these outlets should be carried back and controlled from the panel-board in the superintendent's office, and a separate feeder should be carried from the service switch to the panel for the control of this exit lighting, this feeder connected to the street side of the main service switch, so that the exit lighting will not be disturbed in the event of the opening of the fuse of the building service.

There should be one outlet provided for the lighting of each of the elevator cars, this outlet located in the well shaft and at a point halfway between the basement and the top floor; wires should be left at the outlets in readiness for connection to the flexible cable supplying lighting to the elevator cars. The flexible cable and all connections to these outlets are always made by the elevator contractor. The outlet for the lighting of the elevators should be controlled from a separate circuit from the panel-board and should not be connected to circuits feeding the lighting of the corridors.

Where display signs or posters are to be used at the entrance, the circuits feeding these signs should be carried back and controlled from the panel in the office; all circuits from outside brackets, torches or pedestal fixtures for the lighting of the entrance should be carried back and controlled from the panel.

Where an electric sign is to be used, either at the roof or at the entrance to the building, the master circuit feeding the sign should be controlled from a fused knife-switch on the panel in the office. This circuit should terminate in a steel cutout box set at some point convenient to the sign. All fused cut-outs protecting the individual circuits should be mounted in this cutout box. The box should be as near the sign as is possible, and all wires from the cutouts to the sign should be run in one large conduit, this terminating in a weatherproof entrance bushing. There should be one double pole cutout in the box for each 1320 watts required by the sign, and under average conditions, there should be allowed 12 ten-watt lamps for each 12-inch letter. If a border or scroll is to be used in addition to the letters, there should be 4 ten-watt lamps allowed for each lineal foot of border or scroll. The wiring layout should include all wiring from the panel to the cutout box, including the complete equipment of cutouts, and the empty conduit from the box to the sign; the circuit wires from the box to the sign including all connections between the sign and the cutouts are, as a rule, included under the sign contract.

Organ Installations

By C. A. WHITTEMORE

IT was only a few years ago that the installation of a pipe organ in a theater or public building was looked upon as an epoch-making event. These installations have now become so common and the installation of pipe organs in fine residences is such an everyday occurrence that it no longer is of particular interest. It is, however, a fact that architects and engineers as a rule have not kept pace with the changes made in organ construction and in organ installation. This is too frequently evidenced by the scurrying around, after it has been decided to install an organ, to find the proper space to put it. Where there is even a remote possibility of an organ's being installed in a building it should be carefully considered in the preliminary plans so that space may be left not only for the organ pipes and the keyboard and console, but also for the wind trunking and the electric conduit.

The organ itself is divided into three divisions,— the organ or organ chamber, the key desk or console and the blower. These three units may be placed in close proximity to each other or they may be widely separated. From the key desk to the blower there is usually a 3-inch, spirally-wound galvanized iron pipe with tightly sealed joints. Sometimes this is connected directly with the main trunk line from the blower and sometimes from one of the wind chests in the organ itself, where a standard pressure is maintained. This pipe is used frequently to control the action of the keys, in which case it is a pneumatic-action organ, at times used merely as an auxiliary to the electric control and at times merely to register the volume of the organ pressure. From the key desk in an electric-action organ extends a cable in which, in addition to spare wires left for the purposes of repairing any breakdown on any of the circuits, there are wires corresponding to each stop or note on the key desk.

The valves in the organ chamber which cause the "speaking" of the pipes may be actuated electrically or directly by the wind pressure. In the old days these valves were actuated by thin strips of selected wood to which were fastened threaded pins which made a direct mechanical connection between the key and its corresponding pipe. This was called the "tracker action" organ and is now obsolete. With the old tracker action type and with the pneumatic type the key desk is definitely fixed in position. With the electric-action or the electric-pneumatic (in some forms), the key desk may be picked up at will and moved to any location within the limits of the length of the cable.

The organ chamber, or the sound part of the organ installation, is divided generally into three main sections,— the pedal, the great organ and the swell organ. The pedal organ, as its name implies, consists of that part of the speaking pipes which is directly controlled by the foot pedals. The great organ is usually composed of some of the louder, sharper-voiced pipes and the volume is controlled by a set of shutters in front of the opening from the organ chamber into the auditorium. The swell organ is usually composed of the softer and sweeter pipes and is enclosed in a separate box with a separate set of shades and shutters, the whole construction being enclosed in the main organ chamber. When the main shutters from the organ chamber and the shutters to the swell chamber are closed, the tone will be very soft and remote in effect. The opening of the swell shades produces a little more tone. The opening of the outer shades gives the maximum tone of which the swell organ is capable. These modulations of tone volume are also applicable to the pedal and the great organ, excepting that between these two sections and the auditorium is interposed but one set of shutters.

The swell shutters and the main shutters are graduated, that is they do not all start to close or open at the same time. Every fifth shutter may operate in unison so that the gradual opening effect would be one, five etc., two, six etc., three, seven etc., until the shutters are all open. Some of the organ manufacturers prefer to open them in sections such as one, two — three, four — five, six, and when the first section of shutters is part way open, the second section begins to open. This study of shutter control is a matter of great importance and the desired effect is a gradual increase of tone rather than a sudden break from comparative quiet to maximum volume.

The organ blower is located in the organ chamber at times, and at other times in a part of the building not too remote where the air is as clean as possible. If the air is taken from a room in the basement where there is likely to be dust it will not be long before the dust is blown into the organ chamber and reeds and pipes are soon put out of tune. It is therefore desirable to see that the supply of air is as clean as possible. The blower is usually a direct-connected fan type blower, and from a secondary pulley on the main shaft is belted a small generator set. The generator set will furnish the low potential current for the electric action of the organ itself, so that on the organ side of the blower there is no current heavier than from 10 to 12 volts.

There is, and always will be, a tremendous discussion between the various organ manufacturers as to whether high or low pressure is best. Some contend that high pressure, which means of about 15-inch water column, gives too harsh, blatant a noise; others contend that low pressure, of not over 5-inch water column, is too soft and limpid for bold effects.

There can be no question but that the voicing can be adapted to either method. The voicing and tuning and selecting of pipes for an organ is one detail of organ work with which the architect is seldom familiar, and it can hardly be expected that with the many other things an architect must study he should also take up the study of organ construction and specification.

In the case of competitive bids from various organ manufacturers, a glance through the specifications, which really means the detail of how the organ is to be constructed with the selection and number of pipes,will reveal some interesting things. One organ manufacturer may give 19 sets of pipes ranging from 32 for the pedals to 69 or 72 for the great and swell organs. Another manufacturer on the same set of specifications may indicate a certain number of pipes and some sets of "notes." This would mean the same thing to one who does not understand organ construction, but there is a vast difference. When an organ manufacturer specifies the number of pipes and proposes to install an organ in which a certain number of pipes and a certain number of notes are specified, he means that some of the stops (two or more) may cause the tone to be produced from a single set of pipes. This is sometimes called "borrowing" or "duplexing." One manufacturer is putting in far more material, far more wood and far more metal in his construction than the other man who is merely taking one set of notes from one bank of pipes and altering them to represent two different qualities of tone.

The average theater organ for houses of not over 2,000 or 2,500 capacity will occupy a space about 14 feet square by 18 feet high. This space should be clear of all obstructions, as many of the pipes are actually 16 feet long. Frequently the organ is divided into two parts, one part on either side of the stage. When this is done, the division of pipes should be very carefully arranged or the effect will sound a great deal like an old German street band. In the Capitol Theater in New York there is a divided organ which is so well arranged that the average hearer cannot detect the exact source of sound.

The opening from the organ chamber into the auditorium should be kept as clear as possible. The average size opening from the great chamber would be approximately 8 feet high by 14 feet long. This is an ungainly size of opening to treat in a decorative sense, so that the first thing the architect usually likes to do is to arrange draperies and overhangings in front of these openings. This immediately has a tendency to deaden the tone and render the organ much less valuable. The architect should, on the other hand, design these openings and arrange them as may best suit his design, but also arrange his draperies and hangings so that nothing will interfere with the clear passage of the tone. It is not absolutely necessary to have these openings always of the size mentioned, but the total net area of the grilles through which the tone is admitted should be approximately this size.

Many theaters have organs arranged in or near the upper box level, separated from the auditorium by a soundproof partition with the openings in the proscenium arch itself. Sometimes these openings take the form of decorative grilles extending all around the arch. Often these openings become lattice grilles at intervals in the arch with solid panels between, and sometimes the openings are specially designed to form a distinct part of the architectural treatment of the arch itself. In figuring the net area, it is quite necessary to calculate this from the full-sized details rather than from the scale drawings, so as to be sure to allow the full amount of opening.

In some theaters the organs are located directly on the stage in back of the construction work. With a 35-foot stage one can readily see that an organ space at the extreme rear of this, if built in a separate compartment, would be at some distance from the main auditorium. A situation of this character is not quite so desirable excepting in theaters where a permanent stage setting is desired, such as a large motion picture house, for example, where vaudeville features may or may not be added. The stage for "legitimate" performances could not be all broken up with such an obstruction. In this case it would be necessary to build, as previously suggested, outside of the walls of the stage entirely.

The construction of these walls should be properly studied and prepared with reference to the finish on the organ chamber side. All of the walls surrounding the organ room should if possible be constructed of brick or concrete and then plastered on the surface with a hard plaster and smooth troweled, as this gives a very hard, non-absorbent surface from which the tone will be readily reflected.

If the organ be placed in a position where the tone is not directly admitted to the auditorium, it may be desirable to install deflector boards for the purpose of bending the sound waves in the direction desired. The best analogy to a situation of this kind in determining the deflector boards as to position and angle is to assume that the sound waves act exactly as light waves, and then to assume that the deflector boards may be replaced by mirrors. In this way one can readily calculate with reasonable accuracy the distribution of the sound. These deflector boards should be constructed very rigidly on an angle of channel iron formed with wire lathing and secured in position by a permanent structure after the exact angle has been determined. Then the whole surface should be coated and smoothly troweled with hard plaster.

Plate Description

HOSPITAL FOR THE ILLINOIS CENTRAL R.R., Paducah, Ky. Plates 5, 6.

This structure, of which Richard E. Schmidt, Garden & Martin are the architects, is intended for the care of the employes of the railroad and, when space permits, for the general use of the community. The plans make provision for the white employes of the railroad, for colored employes, and for others who may be admitted as patients, as well as for an out-patient department to care for the ordinary medical treatment of ambulant cases. The building is of a Georgian type, an architectural style which agrees well with the traditions of the south, of sand-faced brick with quite a variety of color and laid in Dutch cross bond. Sills, etc., are of stone and columns, cornices and other exterior trim are of wood painted white. The construction is fireproof, the base course being of concrete with special finish, and floors of tile, concrete and terrazzo. The pitched roof is of wood covered with slate.

At the entrance the main office is so located that the out-patient waiting room is at one side and the hospital reception room at the other, with control of all corridors, entrances and exits of the building. Since the structure faces south the more important departments are placed upon this side and the auxiliary rooms and offices upon the north, the few patients' rooms which have a northern exposure being not objectionable since the heat of Paducah in summer is accompanied by high humidity. Particular care has been taken to insure wards and patients' rooms that should be comfortable during long, hot summer days. This has been accomplished by means of ventilators, properly placed, and the results have been satisfactory. Sun porches are provided upon both the lower and the upper floors at each end of the building.

The kitchens, storerooms, pantries and dining rooms for nurses and patients have been placed in a wing at the rear of the building, and the third floor of the central part of the structure, which from the exterior has much the effect of an attic story, is occupied by the operating rooms and the offices which belong to them. Heating is supplied from a separate building which was part of a former hospital upon this site. The hospital is planned for the accommodation of 98 patients and a personnel of 14; the contract was let in July, 1918, and the cost was 38 cents per cubic foot.

ADMINISTRATION BUILDING, NEW HAVEN HOSPITAL. Plates 7, 8.

This late addition to the buildings of the medical department of Yale University is one of a group of two. These structures have been designed in a modified Georgian style, such as was used for several of the earlier and some of the more recent of the Yale buildings, the walls being of brick laid in Flemish bond, the headers of different shades ranging from light to very dark and laid at random. The cornices and trim are of cast concrete stone.

The Administration Building, dominating the group, is of fireproof construction with reinforced concrete columns, girders, etc., and hollow tile floors, the floors being finished with granolithic surfaces to which linoleum has been applied. For the toilet rooms the floors are of tiles with a tile base. The partitions and furrings are of gypsum blocks, and walls and ceilings are of gypsum plaster, painted. For the interior trim mahogany has been used upon the lower floor, and elsewhere use has been made of Wisconsin red birch, all this woodwork being varnished. In toilet rooms all woodwork has been painted and enameled. Stairways are of iron with platforms and treads of gray Tennessee marble; vacuum steam heating system, direct radiation, has been installed, a central power plant affording steam and vacuum supply.

ANTHONY N. BRADY MEMORIAL LABORATORY, New Haven, Conn. Plate 9.

Details of this pathological laboratory structure are in general quite similar to those of the Administration Building of the New Haven Hospital, with which it is connected by a glazed corridor, but the granolithic floors have been treated with a floor hardener and left exposed; Wisconsin red birch, varnished, has been used throughout for interior trim, but slate has been employed instead of marble for the platforms and treads of the iron stairways. High pressure steam is used for sterilizers. The basement of this structure is planned with many of the departments required in a pathological laboratory building, and in addition to the usual lockers and toilets it contains dark and projection rooms, animal and inoculation rooms, a machine shop, a mortuary room complete with freezing box, refrigerator and incinerator, and a large space for museum storage.

This building was planned by the architects in groups of units each 12 feet, 3 inches, lengthwise of the structure on each side of the central corridor in each story. Each unit is provided with a vertical pipe chase with a horizontal pipe trench connected with the chase. By this arrangement pipes can readily be changed or new pipes installed for any particular unit. Each of the units is, or can be, supplied with hot and cold water, gas, compressed air and suction, together with electricity for laboratory work.

HOUSE OF ARTHUR K. BOURNE, ESQ., Pasadena, Calif. Plates 13, 14.

This house suggesting the old adobe buildings is of frame construction with exterior cement plaster of soft white tone. The trim is white and blinds blue. The roof is of California redwood hand split shakes. The house is heated by hot air from gas furnaces in the basement.

EDITORIAL COMMENT

SOME SIDELIGHTS ON THE CONVENTION

IT has perhaps not been sufficiently recognized that one of the very important and constructive results of conventions of the American Institute of Architects has been the opportunity for interchange of experience and ideas along practical lines of office administration and the promotion of practice. Because of limitations of time these and many other points of general interest are not discussed in regular meetings, but during the hours not given over to regular proceedings one will find interested groups discussing matters that are of concern to architects everywhere.

One topic of special importance at this time is the definite shortage of draftsmen that has resulted from the sudden increase in activity in architects' offices. During the dull period through which we have just passed many of these men left the profession to enter other lines of activity which offer less fluctuating conditions of employment. This brings up an old but interesting subject of discussion, that is, the methods and importance of holding together an office organization in order to assure steady employment to good men and to relieve the distressing conditions of under-supply in times of demand, and insecurity from the draftsmen's viewpoint during lean periods. Several architects who occupy important positions in the profession are now introducing a definite system to meet this situation. The important principles of such an organization method involve a sinking fund, established and developed during times of activity and prosperity for use in less active times, to insure the salaries of important members of the organizations. It is quite evident that until the seasonal problems of the construction industry are solved architectural practice will be somewhat seasonal in its nature and certainly subject to cycles of variation from activity to inactivity, but this can be discounted to a large extent through careful organization

The importance of developing a capable organization merits serious consideration of a profit-sharing system which shall apply to all those in the office who do creative or constructive work. The sinking fund idea is excellent, and there is no question but that some form of profit-sharing introduced in a feasible manner would have an important bearing on the loyalty and efficiency of employes. It would likewise have considerable influence in keeping capable men together in one organization, and there would be less splitting up into small units —a result greatly to be desired in view of present developments in the relations of the architect with his clients and generally with the business world.

AT no time in the history of the profession has so much interest been shown in the economic phases of architectural practice. Architects everywhere are indicating a rapidly developing interest in business methods as related to the construction industry, in the financing of building operations and in various phases of promotional and speculative building operations and real estate development. This point was emphasized by George C. Nimmons in his talk at one of the group luncheons. One architect, whose business is sufficiently large to justify a payroll of nearly $9,000 a week, named as the most important factor in the development of his practice his ability to gauge costs accurately. In his office he maintains capable estimators, and when quoting the cost of a prospective building every effort is made to cause no disappointment by naming a figure so low that contractors' figures and ultimate costs are in excess. Often he is able to complete building projects at costs lower than his estimates, which is always a pleasant surprise to the client and a guarantee of pleasant future relations.

Another indication of changes in practice is the general consensus of opinion that we are entering an era of specialization in architectural design and that every architect should develop at least one logical specialty which will insure a steady clientele for that particular class of buildings.

Casual discussion of the question of building finance indicated two important facts: First, that there is today an ample supply of mortgage money for reasonable investment in practically all parts of the country, and, second, that architects are taking an intelligent and constructive interest in this question of building finance. Many factors are working to place the building industry in a more favorable light from the viewpoint of both the general public and various types of banking and loaning organizations. Building as collateral security for bond issues and mortgage loans is before the public eye in a constructive manner, unequaled in the past. Many architects report that mortgage loan interests are giving more credit to good architecture and greater study to proper planning than formerly. The high cost of building has definitely stressed practical requirements which involve planning for efficiency of purpose and the expression of good architecture without a great increase in investment. Everywhere architects seem to be giving more careful study not only to the reduction of original construction costs but to the use of permanent materials and good equipment which will serve to cut down the factors of obsolescence and maintenance cost. Successful efforts in this field will be of the greatest benefit in establishing the economic value of architectural service.

DECORATION *and* FURNITURE

A DEPARTMENT
DEVOTED TO THE VARIED
PROFESSIONAL & DESIGN INTERESTS
WITH SPECIAL REFERENCE TO
AVAILABLE MATERIALS

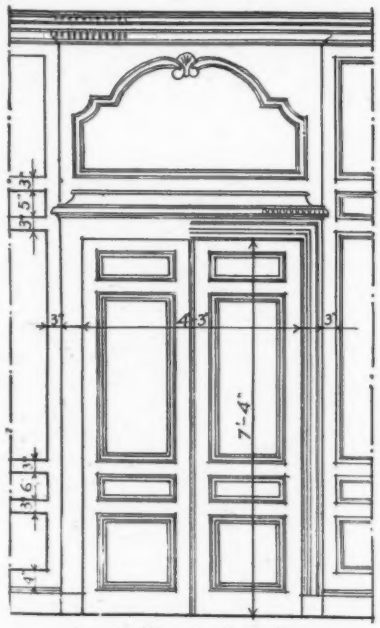
Use of Eighteenth Century French Precedent

INTERIORS OF RESIDENCE OF CHARLES H. SABIN, ESQ., NEW YORK

CROSS & CROSS, ARCHITECTS

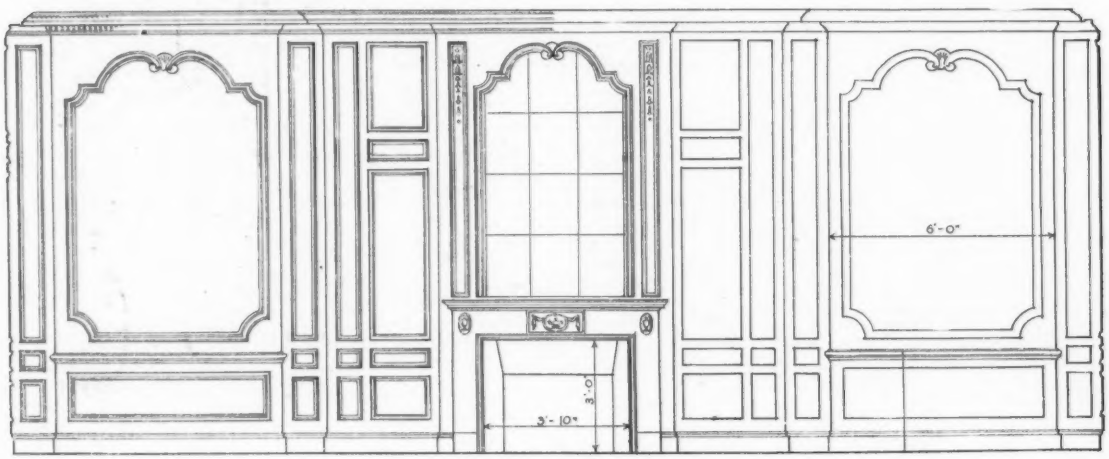
IN late years there has appeared a new interest in the classic French styles for interior decoration. In the wide range of historic European styles there is none more perfect in line, color, harmony and form than that exhibited in the eighteenth century work of France. The period was one of culture, refinement and delicate elegance. It has been unfortunate that the popular conception of the French styles of decoration in America has been influenced largely by the interpretation of the commercial decorator, who in the past has seized upon the extremely ornate and frequently the least well designed examples for his models. The literal reproduction of the most rococo salons, filled with endless quantities of gilded furniture in important city houses of the past generation, aroused a prejudice against French decoration which is but gradually giving way before the present efforts of architects and decorators who, because of a more thorough and intelligent study of the style, are producing interiors that are distinctly modern, yet quietly reminiscent of the charm and beauty of the best of the originals.

The rooms illustrated in these pages are from the New York residence of Mr. Charles H. Sabin, and they show definitely the value of eighteenth century French decoration as a precedent for modern work. These rooms, decorated by Cross & Cross, architects, are of especial interest when it is known that they have been transformed from the usual stereotyped interiors found in the type of city house built for sale. The architects were not obliged to make any important structural changes, aside from a rearrangement of doors to have them open on room axes. The architectural design phase of the problem was limited to the devising of wall paneling to make the proportions of the rooms as pleasing as possible and to providing spaces for certain objects collected by the owner, such as the painted panels and lunettes that appear in the drawing and reception rooms.



Detail of Drawing Room Door

The elliptical tops of these paintings dictated the scheme of the wall paneling in the drawing room, and the ungainly proportions of the paintings have been successfully offset by the sense of height created by the rising curves of the panel mouldings. The walls are painted a greenish gray, toning with the mantel of green and white marble, and parts of the mouldings are enlivened with gold. The three windows are a striking feature of the room, decorated in a Georgian manner with looped-back curtains

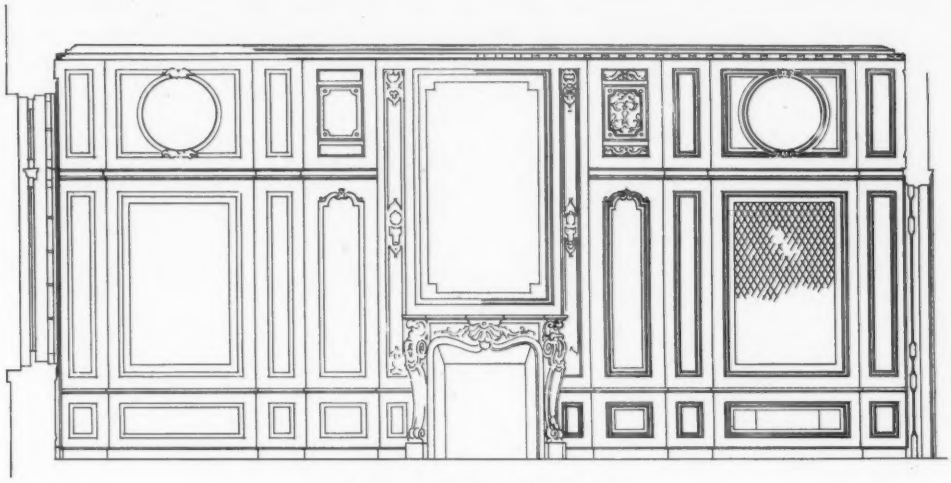


Elevation of Fireplace Side of Drawing Room

DRAWING ROOM, HOUSE OF CHARLES H. SABIN, ESQ., NEW YORK
CROSS & CROSS, ARCHITECTS FOR THE INTERIOR

LIBRARY, HOUSE OF CHARLES H. SABIN, ESQ., NEW YORK

CROSS & CROSS, ARCHITECTS FOR THE INTERIOR

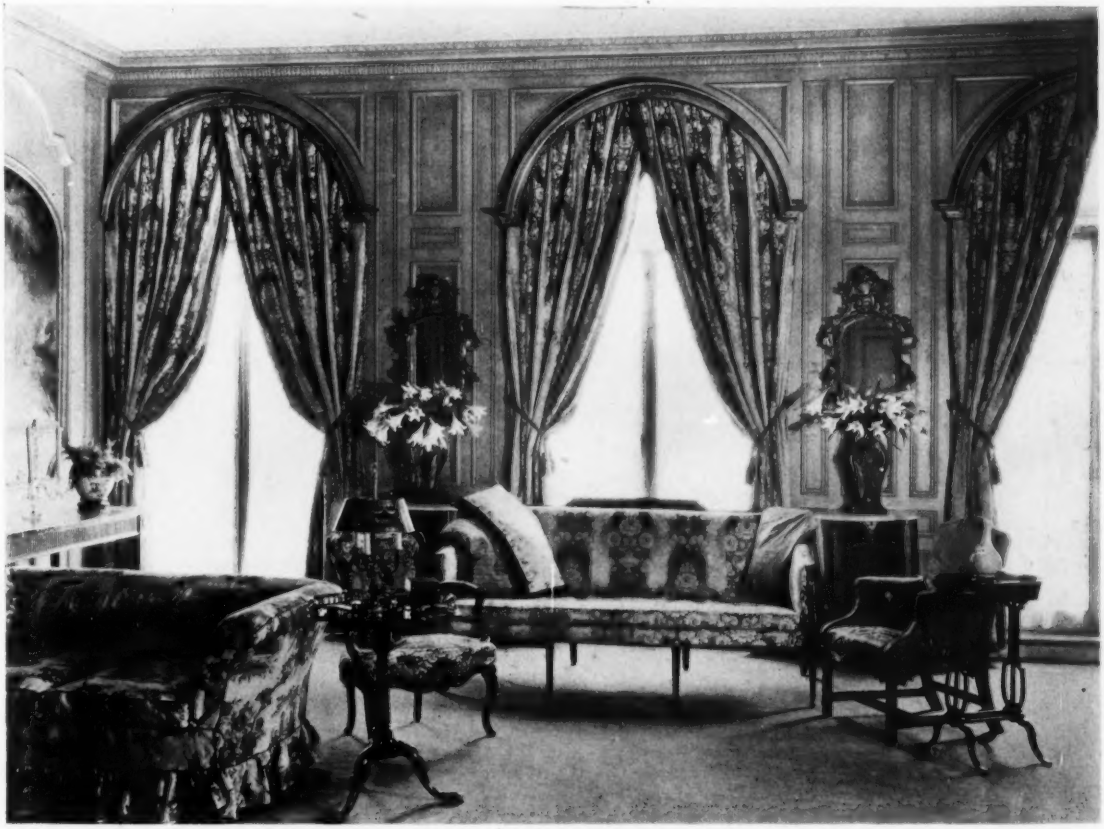


Elevation of Fireplace Side of Library

of damask in broad stripes of rose color and green.

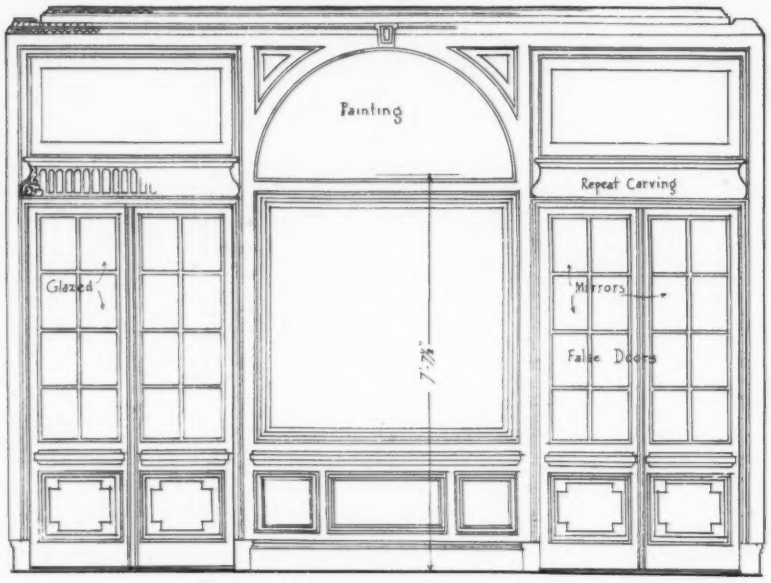
The furnishings of the room are varied in size, color and style, though carefully restricted to one scale. The console tables below the wall paintings are cream and gold, with marble tops; the furniture is chiefly eighteenth century English with damask coverings, but occasionally bright chintzes or needlework, as in the French armchair, are introduced with excellent effect. Opposite the fireplace a feature is provided by an original French desk in black lacquer with ormolu mounts. The interesting grouping of furniture and the color in fabrics appear to advantage against the quiet toned walls and the taupe carpet.

The library is a delightful example of the modern use of Louis XVI motifs. The room is especially



Front End of Drawing Room

restful, and its whole effect is conducive to quiet reading. The walls are paneled in oak which was sand blasted to remove the sharp edges of mouldings and give a soft and aged looking surface. The wood was given no finish beyond a thin application of hot paraffin to seal the surface and preserve its pinkish gray color. The carved panels were executed in the spirit of two old panels brought from a rural district of France. An old marble mantel is used and above it hangs a Raeburn portrait. The dominant color note of the furnishings is blue, provided by the hangings and rug. The books are arranged in cases flush with the walls and are protected by doors



Elevation of Entrance End of Reception Room

Drawing Room Furniture Group Opposite Fireplace

fitted with brass grilles; above the bookcases, busts of American statesmen are set in circular niches. These originally were the usual commercial plaster casts; the stock base of each was removed and a marbleized base substituted; they were then toned and glazed to harmonize with the walls. The lighting fixtures in this room are worthy of particular note; they are reproductions of old sconces in a combination of black marble, alabaster and bronze gilt.

The dining room shows an ingenious use of paint applied to the walls in imitation of marble. The plaster was first covered with linen to give a surface free from any possible cracking; the successive coats of paint successfully eradicate all signs of the linen texture, the finished surface being smooth like that of honed marble but with no suggestion of coldness. The field of the panels imitates Siena marble, and the pilasters and mantel which are of wood, black and gold marble. The room is exceedingly simple in its design and furnishings but of great dignity and richness. Its color scheme is black, gold and green, the curtains being

RECEPTION ROOM ON FIRST FLOOR

DINING ROOM

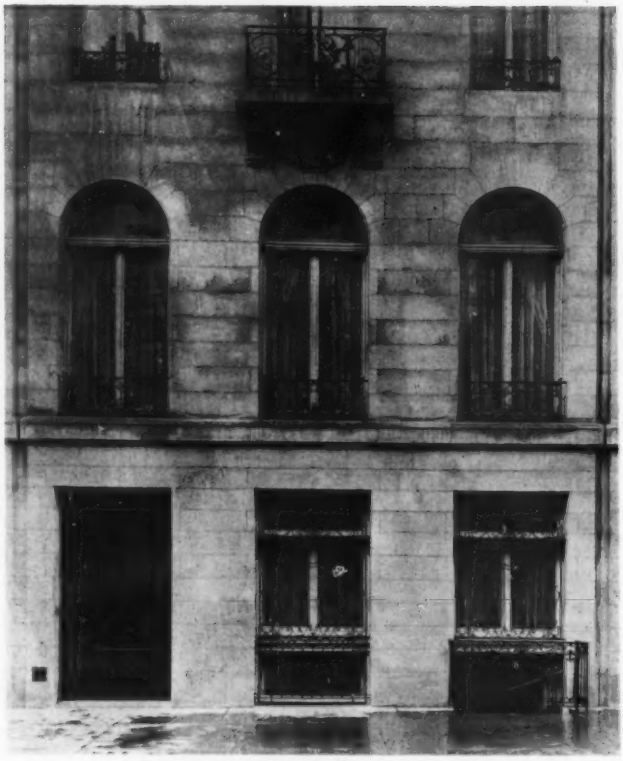
INTERIORS, HOUSE OF CHARLES H. SABIN, ESQ., NEW YORK

CROSS & CROSS, ARCHITECTS

of green silk; the chenille rug is likewise green and the furniture black and gold, the chair upholstery being green velvet. The chairs are an especially graceful type having a shield back with Adam ornament; one is an original and the others are copies.

The drawing room and library are the principal rooms of the second floor and open from a central hall after the usual plan for a city house of narrow frontage. On the first floor the dining room occupies the full width of the house at the rear; on the street front and to the right of the entrance lobby there is a small reception room which is illustrated here. This room has been paneled to accommodate a number of old Italian paintings in lunette shape which were originally a part of the set used in the drawing room. This room is more distinctly French in its furnishing and character than the others. The walls are colored a light gray and the tall windows with small panes are hung with broad curtains of old gold colored taffeta. The entrance side of the room is given a symmetrical treatment to balance the windows, as indicated by the elevation reproduced.

A principle that governed the furnishing of rooms of the eighteenth century is noted in these rooms, and to its observance probably more than to any other feature is the charm of these interiors due. There must be a very evident contrast of vertical and horizontal lines; the paneling should be counted on to give the vertical emphasis, and the furniture should be kept low and small in scale. Another means of acquiring interest that is noted in eighteenth century interiors is the use of the mirror or a large portrait over the mantel to give a focal point to the decoration, and the value of this is shown in several of these illustrations.



Lower Stories of Facade Showing Iron Grilles

Detail of Grille at Entrance

The structural changes that were made to bring doors on axes or in symmetry with other features of the rooms before a suitable scheme of decoration could be devised indicate the necessity that exists in planning of residences and other buildings where interior effect is a consideration, for determining the type of decoration at the same time the structural plan is worked out. Interiors that aspire to any pretension in finish and decoration must have symmetrical wall treatment; the placing of windows and doors, and the general disposition of wall spaces are, therefore, of direct importance from a decorative standpoint.

The detailed exterior views shown on this page illustrate the pleasing wrought-iron grilles and balconies designed by the architects as a note of embellishment and distinction to the facade. This ironwork is of French design, agreeing with the style of the house, and its execution is of the best modern craftsmanship.

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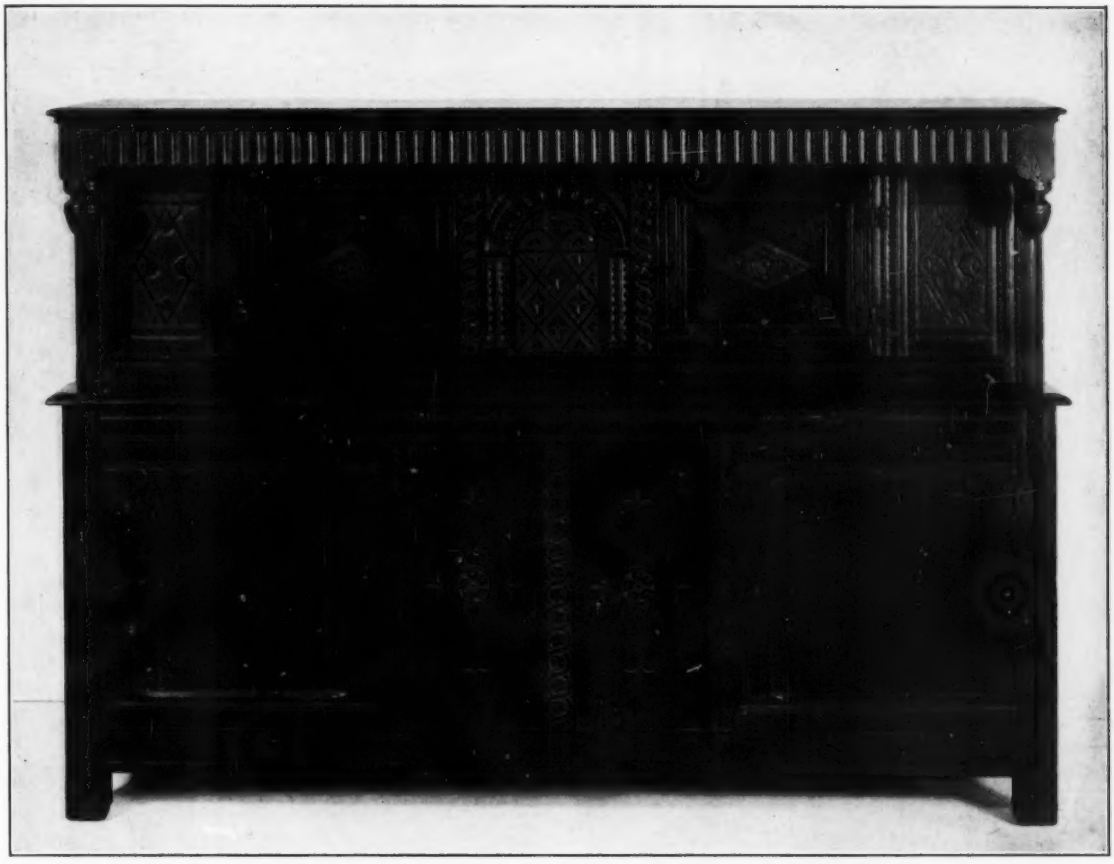
KENSINGTON FURNITURE



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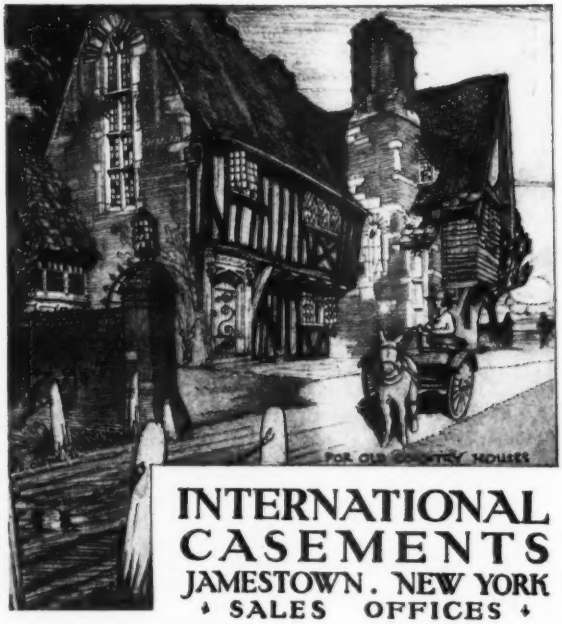

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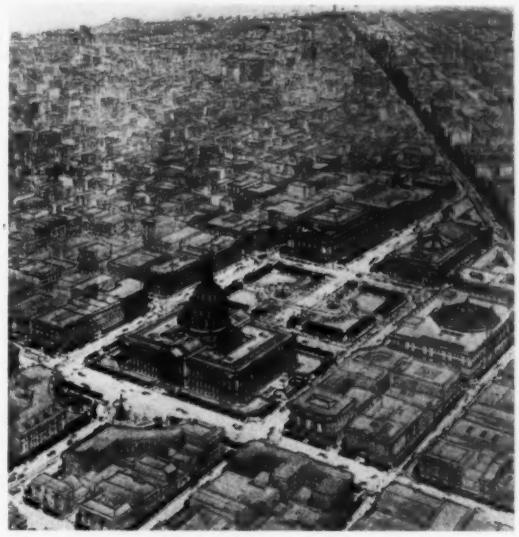
BOOK DEPARTMENT

THE AMERICAN VITRUVIUS: An Architect's Handbook of Civic Art. By Werner Hegemann and Elbert Peets. 298 pp., 12 x 16 ins. Price $40. The Architectural Book Publishing Co., New York.

IN selecting the title of this volume the authors say they have intended to place at their masthead a symbol of their allegiance to the classical ideals associated with the Vitruvian tradition. This tradition, of course, rests upon fundamentals which are clearly defined and have their basis in the forms of classic times, and its ideals are equally well defined and well grounded. The chief of these ideals, although it is frequently forgotten or ignored in these days of unrestrained individualism, is that the basic unit of design in architecture is not merely the actual building but includes the entire environment as well. Colin Campbell's precedent of including in his "Vitruvius Britannicus" only English material has not led the authors of this work to confine themselves to what has been done in America. The artistic ideal which inspired the "Vitruvius Britannicus" is not limited as to nationality, peculiar to neither England nor America, but is the same spirit which wrought architectural wonders over the whole of Europe.



Design for Civic Center of San Francisco
By John G. Howard, F. H. Meyer and John Reid, Jr.
Illustration from "The American Vitruvius"

Harmonious development of architecture requires application of tradition as well as of bold development of the inherent possibilities of such tradition into new forms, and it is certainly beyond question that in matters of plan and mass there is inspiration to be found wherever the builders have striven for order, balance, symmetry and harmony. Having outlined their position as to the necessity of considering the relation between buildings and their settings, the authors elaborate the thesis and in various chapters consider somewhat critically such important subjects as: The Modern Revival of Civic Art; Plaza and Court Design in Europe; The Grouping of Buildings in America; Architectural Street Design; Garden Art and Civic Art; and City Plans as Unified Designs. The work is lavishly illustrated with halftones, and although in the foreword and in the preface the authors disclaim an attempt to cover the entire range of expression of civic art, almost every important work of the nature indicated, in Europe as well as America, is included, and in countless instances plans or maps of cities or districts about certain buildings are given.

The authors point out the fact that civic art can learn most from a study of the triumphs of the seventeenth and eighteenth centuries, which in turn were deeply influenced by a study of classic antiquity. They say that while the modern architect learned long ago to study even the smallest details of buildings of the classic and renaissance periods, the far more important settings of the buildings from which he takes these details have interested him but little. Would it not be fairer to say that the modern architect fully realizes the importance of these settings, but that he realizes only too well the

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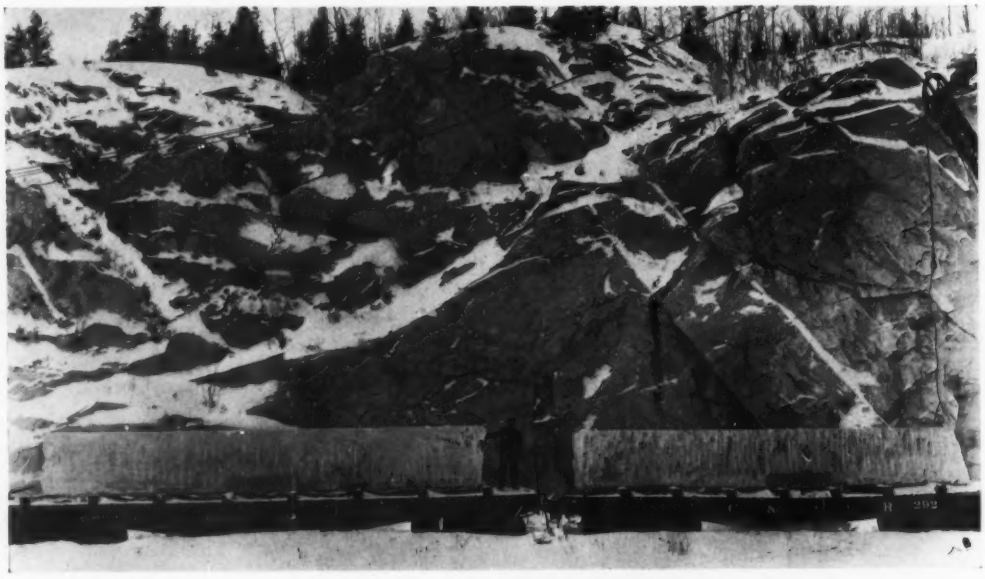

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Most bankers view sympathetically the architect's insistence on marble.

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impossibility of attaining anything even approximating their beauty under modern conditions and that he therefore concentrates his interest upon the securing of such data as he may reasonably hope to use?

Modern American architects and town planners are working under conditions far different from those which obtained when the superb squares, places and plazas of England, France or Italy were being produced. Instead of having at his back a strong, responsible national or municipal government, assured of its continued existence and willing as well as financially able to enforce the carrying out of any project which it undertook for public improvement, the modern architect must only too often cope with the difficulties presented by constantly changing administrations in the case of a government, either national or municipal, and even more frequently with the greater difficulty of there being many individual owners of property, possessed of widely different views. Even where a government is the client a committee must generally be propitiated and won over to anything which departs from the conventional, and even then there are almost always difficulties of a financial nature to be solved, for in America architects have not such advantages as were possessed by the architects of Europe—say of France during the reign of Louis XIV—when they were able to draw lavishly upon national or city treasuries, replenished by levying additional taxes when further financial resources were required. Where all these difficulties have been overcome there have resulted in America many noble examples of state or municipal architecture, such as state capitols or universities, city libraries, civic centers or hospital groups, illustrations of many being contained in this extremely well illustrated volume.

While emphasizing, perhaps, the importance of city planning and giving countless illustrations and plans of successful work of this valuable nature, the broad scope of this volume makes possible its consideration of such minor problems as are found in the planning of residence groups, sometimes in cities but more frequently in suburban districts where space exists for adequate development. Recognition is also given to many instances where the planning of small towns or villages has been successfully accomplished, a notable example being Yorkship Village, where again success was possible only because behind the plan there was but a single ownership to prevent the town's developing into the usual chaos.

The authors of this volume see in the planning of American collegiate groups a most hopeful outlook for architectural planning upon a considerable scale, and they review the planning and building at Columbia, Sweet Briar College, Johns Hopkins and the University of California and the restorations at the University of Virginia, together with certain of the newer dormitories at Harvard as indications of undoubted growth of good taste and appreciation of collegiate work. The tall building which is now recognized as a necessary part of modern architecture, and which is sometimes regarded as being a menace to the development of an American city, is regarded by the authors as possessing possibilities in the beautifying of a city which are not often recognized, particularly when the environment of such a building permits its being tied in or united to its surroundings instead of making it a discordant element as it only too often is.

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which sum up the designing of the house, the decorating and furnishing of the interior, and the development of the garden.

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HOW FRANCE BUILT HER CATHEDRALS. By Elizabeth Boyle O'Reilly, Honorary Member of the *Société Française d'Archéologie*. 612 pp., 6 x 9 ins. Price $6. Harper and Brothers, New York.

GENERATIONS of enthusiastic admirers of the Gothic architecture of France have left tangible proof of their enthusiasm in the vast number of volumes in which are recorded for posterity the results of their patient historical inquiry or archæological research;—few of the admirers of these architectural splendors of a vanished age have been chiefly concerned with what might perhaps be called the "human background" against which they were reared.

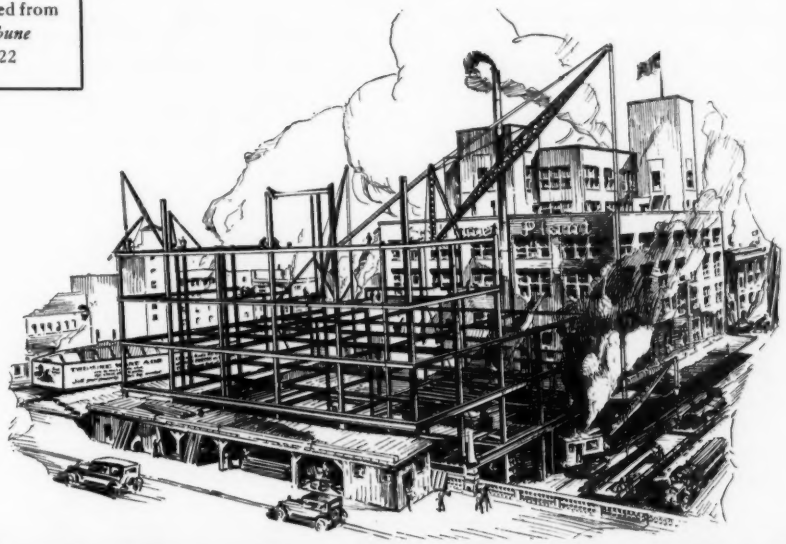
The present volume is the matured and well-considered result of many years of travel and careful study upon the part of a writer who possesses the rare faculty of helping her readers to actually visualize what is being read upon the printed page, and is concerned perhaps with the history of the times which produced the Gothic of France almost as much as with its actual design and construction. The author weaves a marvelous narrative of those centuries when popular enthusiasm and religious fervor covered France with the rich flowering of Gothic art in the form of cathedrals and abbeys—literally *Gesta Dei per Francos*. Here is explained the very meaning of Gothic architecture—not so much a form of design, in which considerable use is made of pointed arches, as an ingenious system of construction which involves careful handling of thrust, counterthrust and balance, and the author traces the progress of Gothic from its foundation upon the earlier Romanesque, through stages of experiment until it culminated in the fragile and nervously graceful masonry of Amiens, soaring toward heaven and constituting a lace-like frame for the triumphs of glass, an art which was brought to a rich fruition during those same centuries. Few writers have so well related the progress of architectural development and so vividly portrayed the glories of that privileged corner of a highly favored land, the "Ile-de-France," a name by which old geographers designated the area enclosed by the Seine, the Oise, the Marne and the Aisne, where arose the most brilliant of Gothic achievements.

Because of its historical importance, added to the care with which architectural obscurities have been cleared up, this work will prove to be an invaluable addition to an architect's library, supplying as it does data which will probably not be found in other books of a more strictly architectural nature. The entire work is splendidly documented and the unusually complete index has been prepared with the care which has been given to every other detail of this fascinating book. Much of its interest is due to the spirited illustrations from drawings by A. Paul de Leslie.

SPANISH INTERIORS AND FURNITURE. Part II. By Arthur Byne and Mildred Stapley. A portfolio of views of Spanish interiors and details of furniture. 50 plates. 10¾ x 13¾ ins. Price $10. William Helburn, Inc., New York.

THE second part of this valuable work, which is to include four sections, is a mine of rich suggestion to architects and interior decorators who have discovered the possibilities which lie in the use of the Spanish types of interior architecture, furnishing and decoration. As with the interiors of Italian homes, the domestic interiors of Spain emphasize the difference which is obtained by contrast—the use of a plain, unadorned

This page is reprinted from
The Chicago Tribune
of June 10, 1922



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material as a foil to another of extreme richness, and these plates abound in illustrations which show the use of richly carved wood, polychrome tiles and pottery or sumptuously worked metal, which are given the desired degree of decorative emphasis by being used in connection with rough plaster or with wood which has been merely oiled.

It may be its simplicity of construction as well as of decoration which lends to Spanish furniture a particular interest to craftsmen and wood carvers, and to reproduce many of these quaint and decorative old benches, chairs, tables and other objects could hardly be beyond the power of many craftsmen of ordinary skill. Possibly with this in mind the authors of this work have included working drawings of a number of pieces and many designs of rosettes and panels, as well as of other details such as the arm ends of chairs in simple carving, which of course add greatly to the practical value of the portfolio. Craftsmen whose skill leads them to attempting more exacting work will find interest in a number of drawings of larger pieces, such as cupboards, in which considerable use is made of boldly carved panels and drawer fronts, or of walnut spindles with turning which is characteristically Spanish.

This portfolio, like Part I of this work, contains countless illustrations which suggest the aid to interior architecture which is given by such decorative accessories as tiles, various forms of pottery, fabrics, ironwork and other objects for the production of which Spanish craftsmanship has long been renowned. An important part of any Spanish home is its courtyard or patio, and since such semi out-of-door spaces are frequently included, under one name or another, in American homes the Spanish treatment which is illustrated in a number of these plates constitutes still another element of value to the work.

THE PRINCIPLES OF INTERIOR DECORATION. By Bernard C. Jakway. 289 pp., 5½ x 8¼ ins. Price $2.50. The Macmillan Company, New York.

THE general recognition which is now accorded interior decoration as a logical part of the practice of an architect, particularly of an architect whose activities include the designing of residences and apartment houses, gives to the subject of adequate training in the principles of interior decoration an importance which is highly practical. Contrary to the belief held by many, skill in the art of interior decorating does not come by intuition but is the result of knowledge which must be acquired, and while the grasping of its underlying principles is no doubt aided by the possession of natural good taste, really successful work in this field presupposes considerable training, which must be supplemented by actual experience and practice. The art of interior decoration has suffered in the past—and is suffering today—because so many individuals have undertaken such work without either the training or the experience which would justify their calling themselves interior decorators.

The present volume is a notable addition to the rather small number of books which actually contribute to the working knowledge of those who would seriously study the subject. While in no sense an elementary work, it begins with the fundamentals of interior decorating and discusses the various subdivisions of the subject in the clearest terms possible, the points involved being emphasized by drawings in many instances and in numerous cases by illustrations of actual rooms. In 17 chapters the work covers the different aspects of the subject, some of the chapter headings taken at random being: Fitness to Purpose; The Grammar of Decoration; Line and Form; The Law of Contrast, and Color Harmony. An especially valuable chapter is that entitled "Proportion," in which considerable attention is given to the discussion of scale. A really excellent book, which should be brought to the attention of anyone interested in the study of the somewhat broad subject of interior decoration and which would be of much practical value to most architects as well.

LA CITE-JARDIN. By Georges Benoit-Lévy. 290 pp., 6¾ x 8¾ ins. Editions des Cités-Jardins de France, 167 Rue Montmartre, Paris.

THIS work is one of a number by the same author on various aspects of the "garden city" movement and is concerned largely with an explanation of the garden city and an exposition of the principles which underlie the building and administration of one or two of the chief English settlements of this kind. The author considers the subject in close detail, and the volume gives an excellent idea of the villages themselves and of the life which goes on within them, and his text is illustrated with quite a number of halftones which show the tastefully designed and well placed structures of various kinds which the English architects so well understand designing for these garden city settlements.

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SERVICE SECTION
of THE ARCHITECTURAL FORUM

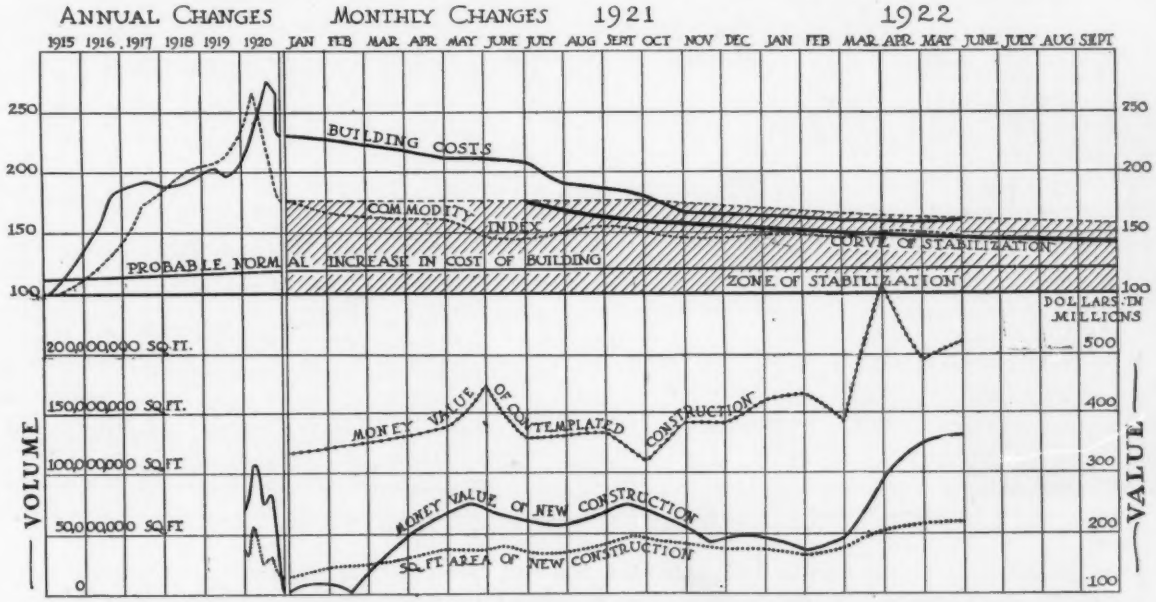
Information on economic aspects of construction and direct service for architects on subjects allied to building, through members of THE FORUM Consultation Committee

The Building Situation

THE reaction of the large number of building permits filed in March (as shown in the chart below as "Money Value of Contemplated Construction") is indicated by the rapid rise of the trend lines showing volume and value of new building construction during April. The month of May shows this large volume maintaining its strength, and while it may be expected that there will be a seasonal decrease in the summer, it is quite certain that the lines indicating volume and value of building will maintain a considerably higher level than during 1921.

An interesting fact shown by an examination of the trend lines on the lower part of the chart is that we have passed the first wave of building activity, in 1921, which was to a great extent of speculative character. We have now entered the second wave of activity, characterized by a better type of building in which architectural design receives far greater consideration. It will be noted that in the months of March, April and May of 1921 there was a considerable rise in the lines indicating building volume and value, but it will also be remembered that architects did not greatly benefit at that time. During the period of the upward swing of the same lines in April and May of 1922 architects have benefited directly because of the better types of construction involved in this second wave of activity.

There has been a slight upward trend in the index of building cost. This is one of a number of slight increases which we have predicted as resulting from a sudden demand for materials and labor at a time when material stocks were low. It is interesting to note, however, that production is increasing and that a large proportion of the building material plants are working full time, and in many cases over-time, in order to meet the demand. It is not anticipated that cost increases will be great.

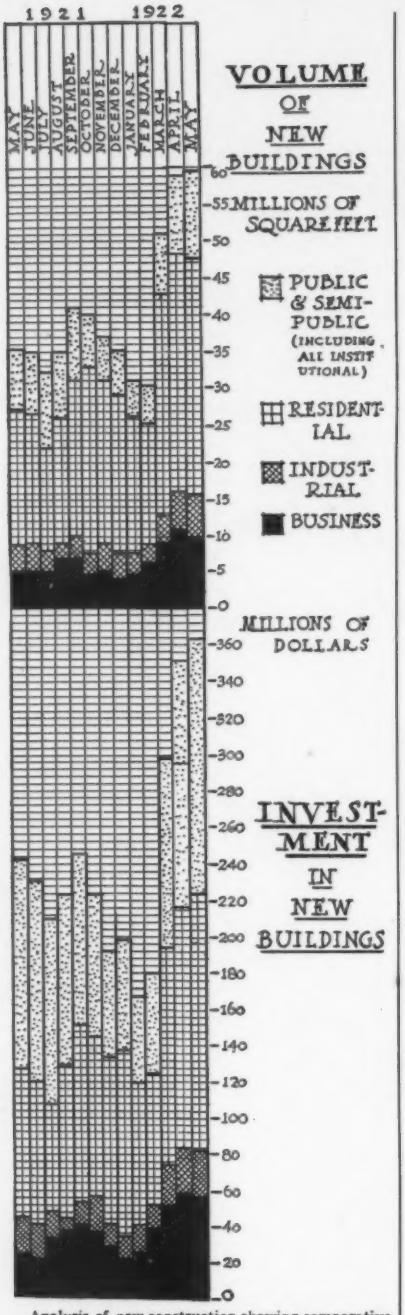


THIS chart is presented monthly with trend lines extended to the most recent date of available information. Its purpose is to show actual changes in the cost of building construction and the effect upon new building volume and investment as the *index line of building cost* approaches or recedes from the "curve of stabilization."

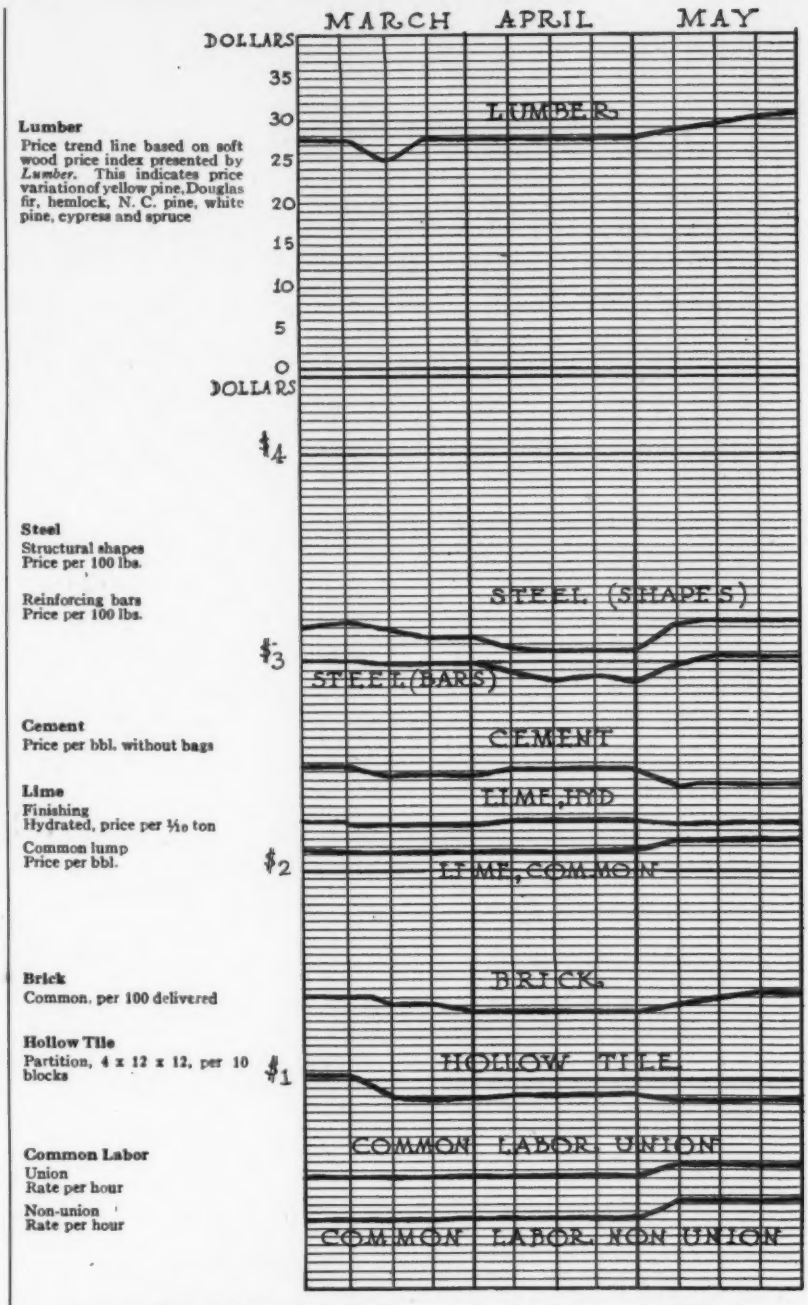
The CURVE OF STABILIZATION represents the building cost line at which investors in this field may be expected to build without fear of too great shrinkage in the reproduction value or income value of new buildings. The index line representing actual cost of building entered the ZONE OF STABILIZATION in the fall of 1921. If this cost line passes *out* of the zone of stabilization, building volume will decrease materially.

The degree of the curve of stabilization is based on (a) an analysis of time involved in return to normal conditions after the civil war and that of 1812; (b) the effect of economic control exercised by the Federal Reserve Bank in accelerating this return after the recent war, and (c) an estimate of the probable normal increase in building cost.

Factors of Fluctuation in Building Costs



Analysis of new construction showing comparative importance of major building types in volume and investment.



Figures used in developing all trend lines represent average prices to contractors in following cities: New York, Chicago, Denver, Seattle, Minneapolis, Atlanta, Dallas and San Francisco

THE graphic chart at the right is presented for the purpose of showing fluctuations in a number of important building materials and in labor costs. These fluctuations cover a period of three months and are shown in each issue of the Service Section in order to make possible at least a partial analysis of the building cost trend line shown on the preceding page.

The material market during May and June has shown an increase in certain basic materials such as steel, lumber and common brick. At certain points in the country the increase in the cost of brick has been particularly noticeable, in New York, for instance, where it was found difficult to get brick at any price. To these increases may be added some increase in labor cost owing to increased demand and the payment of premiums to good mechanics. Some of these increases have resulted in a reaction which is shown upon the chart on the preceding page where it will be noticed that the index of the cost of building has gone up about two points.

Whenever there is exerted a sudden pressure of demand, particularly when it has not been thoroughly anticipated by manufacturers, it is to be expected that there will be some increase in cost. It is usually true, however, that this is but a temporary condition and will not affect the gradual downward trend of material prices.

BUILDING MATERIAL PRICES

Table Showing Average Prices Paid by Contractors for Building Materials at Local Distributing Points as of May 1, 1922. Prepared by Division of Building and Housing of the Department of Commerce from Prices Secured through the Bureau of Census

Commodity	Size or Condition	Unit	Mass. Fitchburg	Mass. Haverhill	N.Y. Buffalo	Penn. Pittsburgh	Penn. Erie	Md. Baltimore	W. Va. Fairmont	S. C. Columbia	Ga. Savannah	Michigan Detroit	Michigan Pontiac	Michigan Saginaw	Wis. Milwaukee	Minn. Duluth	Cedar Rapids	Iowa Waterloo	Iowa Council Bluffs	Ill. Chicago
Common Brick		1,000	*$21.00	$20.00	$17.12	$16.00	$15.75	*$17.00	$21.00	$10.50	$13.50	$16.00	$14.40	$12.00	*$12.00	$14.50	$14.30	$14.90	$17.50	$11.00
Portland Cement	Excl. of containers	Bbl	*2.65	2.85	2.36	2.40	3.00	2.31	2.30	2.90	3.00	2.85	2.29	2.11	*2.40	2.40	2.21	2.33	2.32	1.87
Yellow Pine No. 1	Dimension 2x4-16' S1S1E	M	*62.00	.....	.....	47.00	.....	.....	35.00	.....	25.00	40.50	36.00	45.00	.....	.....	41.00	42.00	40.50	37.00
Douglas Fir No. 1	Dimension 2x4-16' S1S1E	M	.....	.....	.....	.....	.....	.....	.....	.....	.....	40.50	.....	47.00	*37.00	35.00	41.00	42.00	39.50	.....
N. Carolina Pine No. 1	Dimension 2x4-16' S1S1E	M	.....	44.00	.....	.....	.....	32.50	.....	17.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Common Boards No. 1	1x6	M	*40.00	36.00	29.50	45.00	.....	35.00	37.00	30.00	.....	.....	40.00	37.50	*32.00	35.00	35.00	36.00	38.00	31.00
Y. P. Flooring E.G."C"	1x4-10'-16'	M	.....	.....	.....	72.00	.....	50.00	68.00	50.00	50.00	70.00	.....	.....	.....	85.00	87.00	96.00	100.00	.....
Douglas Fir V.G. No. 2	1x4-10'-16'	M	.....	.....	.....	.....	.....	.....	.....	.....	.....	70.00	.....	.....	.....	75.00	92.00	96.00	90.00	.....
Red Cedar Shingles	Extra clear 16" 5 to 2	100 sq. ft.	*5.50	6.00	5.70	4.68	5.50	.....	5.00	5.75	.....	5.40	5.75	5.00	.....	5.50	6.25	7.00	6.50	.....
Cypress Shingles	Extra clear 16" 5 to 2	100 sq. ft.	.....	.....	.....	.....	7.00	.....	.....	5.00	.....	.....	.....	.....	*6.00	.....	.....	.....	.....	.....
Composition Shingles	Crushed slate surfaced	100 sq. ft.	.....	6.00	.....	7.25	7.00	5.80	*7.00	6.50	6.50	5.22	5.70	6.50	*7.00	6.00	5.75	8.00	8.25	.....
Gypsum Plaster Board	½"	1,000 sq. ft.	*40.00	44.00	45.00	37.50	50.00	35.00	25.15	32.00	37.50	30.00	23.93	32.00	*38.00	43.00	40.00	25.00	.....	.....
Lime	Hyd. Com.	Ton	*20.00	19.00	18.00	20.00	19.00	13.50	13.10	19.00	22.20	15.20	13.70	15.00	*20.00	.....	15.40	20.00	17.85	14.70
Building Sand		Cu. yd.	*2.00	2.25	1.28	3.37	2.50	1.75	3.25	.95	2.00	2.61	1.50	2.25	*3.00	1.25	1.05	1.50	2.43	2.25
Crushed Stone	¾"	Cu. yd.	*3.70	3.00	1.62	6.87	3.00	2.75	4.50	3.00	5.10	3.00	1.48	3.00	*2.75	2.60	2.03	3.00	3.60	2.25
Window Glass	Single A 10"x12"	50 sq. ft.	*4.50	3.75	3.90	2.80	.....	4.50	4.20	4.00	.....	3.60	.....	5.40	.....	5.00	.....	7.00	.....	.....
Hollow Tile	8"x12"x12"	Each	*.20	.24	.19	.19	.18	.19	.14	.14	.....	.19	.17	.15	*.15	.....	.12	.12	.....	.....
Cast Iron Pipe	4" E.H. 13 lbs. per ft.	Ton	.....	.....	58.80	51.74	.....	48.00	45.00	.....	.....	53.00	52.00	45.00	.....	50.40	53.90	45.00	.....	.....
Steel Pipe	1" galv.	100 ft.	.....	.....	10.00	7.82	.....	7.56	7.75	9.00	.....	8.75	8.50	8.75	.....	9.30	9.61	9.50	.....	.....
Reinforcement Bars	¾" square	100 lbs.	.....	3.50	.....	2.37	.....	.....	.....	.....	3.00	2.60	2.40	2.85	*2.50	.....	2.75	.....	3.05	.....
Structural Steel	Fab. 6" I-beams	100 lbs.	*3.25	4.00	*3.05	.....	.....	.....	3.25	3.00	3.00	3.50	.....	3.00	.....	3.25	4.00	3.20	3.45	.....
Gypsum Plaster	Neat	Ton	*25.50	.....	13.50	22.00	24.00	18.00	14.00	17.50	21.50	19.00	13.90	15.00	*15.00	21.50	12.00	13.60	17.50	.....
Roofing Slate	No. 1 Ribbon	100 sq. ft.	*17.00	.....	.....	13.50	.....	.....	11.50	12.00	.....	17.50	17.10	.....	.....	.....	.....	20.00	.....	.....
Tar Paper, Roofing	2-ply 75 lbs. per roll of	100 sq. ft.	*3.00	2.40	2.00	1.95	2.15	.....	.....	2.15	1.90	2.75	2.75	2.75	.....	2.75	2.50	2.45	2.90	.....
Rosin Sized Sheathing	3-ply 30 lbs. per roll of	500 sq. ft.	.....	1.50	1.05	1.35	.85	1.25	.85	1.00	.75	1.00	1.00	.....	.....	1.00	1.10	1.47	1.40	.....

*F.O.B. job

Commodity	Size or Condition	Unit	Mo. St. Louis	Mo. Kansas City	Ohio Akron	Ohio Youngstown	Ohio Dayton	Ohio Cincinnati	Ohio Toledo	Ohio Cleveland	Ariz. Tucson	Ark. Little Rock	La. Shreveport	Texas San Antonio	Texas Dallas	Wash. Spokane	Wash. Seattle	No. Dak. Grand Forks	Calif. Pasadena	Calif. San Francisco
Common Brick		1,000	*$14.00	$16.50	*$13.50	$14.55	*$16.50	*$18.00	.....	*$14.00	$10.00	$12.50	$16.00	$16.00	$11.15	$14.25	$14.00	$14.00	*$17.00	$15.50
Portland Cement	Excl. of containers	Bbl	*2.60	2.70	*2.76	.....	*2.77	2.30	$3.08	*2.64	.....	3.80	3.60	3.00	2.80	2.90	2.95	3.00	*3.20	2.55
Yellow Pine No. 1	Dimension 2x4-16' S1S1E	M	*37.00	.....	*40.00	45.00	*45.00	*38.00	43.00	*50.00	.....	.....	41.00	45.00	27.00	.....	.....	.....	.....	.....
Douglas Fir No. 1	Dimension 2x4-16' S1S1E	M	*39.00	43.50	.....	.....	.....	.....	.....	.....	50.00	25.00	.....	.....	.....	.....	.....	38.00	*48.00	30.00
N. Carolina Pine No. 1	Dimension 2x4-16' S1S1E	M	.....	.....	.....	.....	*45.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Common Boards No. 1	1x6	M	*41.00	48.00	*40.00	45.00	.....	*34.50	60.00	*58.00	50.00	35.00	46.00	48.00	32.00	.....	15.00	32.00	.....	28.00
Y. P. Flooring E.G."C"	1x4-10'-16'	M	*61.00	80.00	*70.00	85.00	.....	.....	75.00	*84.00	.....	58.00	86.00	75.00	.....	.....	.....	85.00	.....	.....
Douglas Fir V.G. No. 2	1x4-10'-16'	M	.....	64.50	.....	.....	.....	.....	.....	.....	92.50	.....	.....	.....	.....	.....	50.00	.....	*85.00	65.00
Red Cedar Shingles	Extra clear 16" 5 to 2	100 sq. ft.	*5.95	5.00	*5.20	7.00	*5.50	*4.50	5.40	*5.04	6.00	4.80	7.00	7.00	4.50	.....	3.00	5.00	*5.85	4.60
Cypress Shingles	Extra clear 16" 5 to 2	100 sq. ft.	.....	.....	.....	.....	.....	.....	.....	.....	.....	5.00	8.00	.....	4.75	.....	.....	.....	.....	.....
Composition Shingles	Crushed slate surfaced	100 sq. ft.	*6.00	5.80	.....	.....	*6.50	*5.75	.....	*6.25	.....	6.25	7.00	.....	.....	.....	.....	8.00	.....	9.75
Gypsum Plaster Board	½"	1,000 sq. ft.	*43.00	32.50	*47.50	50.00	*32.50	30.00	40.00	*54.00	55.00	35.00	45.00	52.00	35.00	.....	40.00	55.00	*50.00	.....
Lime	Hyd. Com.	Ton	.....	24.00	*17.00	14.10	*14.00	12.50	.....	*14.80	15.00	25.00	27.50	22.50	16.00	.....	24.00	28.00	*28.00	20.00
Building Sand		Cu. yd.	*2.56	2.35	*2.22	.....	*1.85	1.35	.....	*2.50	1.15	1.00	2.00	2.75	2.25	.....	1.50	3.00	*1.75	1.50
Crushed Stone	¾"	Cu. yd.	.....	3.00	*4.06	.....	.....	1.75	.....	*3.50	3.00	2.00	5.00	2.60	2.75	.....	.....	6.00	*3.00	2.50
Window Glass	Single A 10"x12"	50 sq. ft.	*3.90	4.50	.....	4.50	*4.50	.....	.....	.....	5.40	5.00	4.50	5.40	.....	4.43	.....	.....	.....	4.21
Hollow Tile	8"x12"x12"	Each	.....	.22	.14	.14	.18	.16	.....	.....	.18	.20	.25	.21	.....	.....	.....	.....	.....	.18
Cast Iron Pipe	4" E.H. 13 lbs. per ft.	Ton	.....	.....	.....	.....	*65.00	.....	.....	.....	.....	65.00	77.00	59.00	.....	60.00	60.00	.....	.....	63.84
Steel Pipe	1" galv.	100 ft.	.....	.....	*8.36	8.27	*8.57	.....	.....	.....	9.95	11.00	9.40	9.40	.....	10.26	10.00	.....	.....	9.00
Reinforcement Bars	¾" square	100 lbs.	.....	2.90	*2.75	.....	*2.50	.....	.....	.....	4.00	3.25	4.00	3.75	4.00	3.75	3.25	.....	.....	.....
Structural Steel	Fab. 6" I-beams	100 lbs.	3.35	3.75	*2.75	3.90	*3.25	.....	.....	.....	.....	3.50	4.00	.....	.....	.....	3.35	.....	.....	3.90
Gypsum Plaster	Neat	Ton	*19.50	15.50	*19.00	22.00	*19.00	.....	.....	.....	23.00	25.00	24.00	24.00	.....	.....	20.00	27.50	*21.00	14.80
Roofing Slate	No. 1 Ribbon	100 sq. ft.	.....	.....	.....	14.00	*16.50	.....	.....	.....	.....	16.00	12.00	.....	.....	.....	.....	.....	.....	.....
Tar Paper, Roofing	2-ply 75 lbs. per roll of	100 sq. ft.	.....	3.00	.....	2.15	*2.25	.....	.....	*2.50	3.25	2.25	2.25	2.85	2.00	.....	2.60	3.25	*2.50	.....
Rosin Sized Sheathing	3-ply 30 lbs. per roll of	500 sq. ft.	*.72	1.20	.....	.75	*1.15	.....	.....	.....	1.35	1.20	1.00	1.80	.....	1.23	.....	1.50	.....	.....

*F.O.B. job

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A group of nationally known experts on various technical subjects allied to building, providing a direct service to architects

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(*b*) That no Committee member has affiliations with any manufacturer;
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THE FORUM DIGEST

A SURVEY OF IMPORTANT CURRENT ARTICLES ON BUILDING ECONOMICS AND BUSINESS CONDITIONS AFFECTING CONSTRUCTION

The Editors of this Department select from a wide range of publications matter of definite interest to Architects which would otherwise be available only through laborious effort

CONSTRUCTION COST IS LIKELY TO ADVANCE

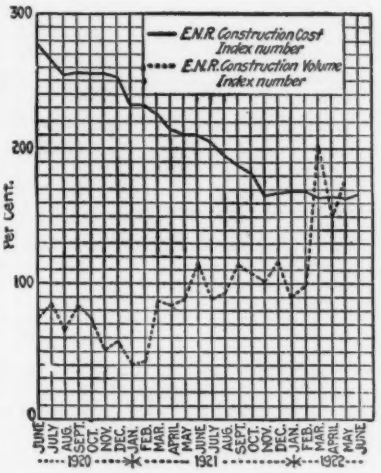
A PREDICTION of increased construction costs appears in *Engineering News-Record*. Since June, 1920, the construction cost curve has declined steadily. The heaviest drops from one month to the next were during January, 1920, and October, 1921. The latter drop—16 points or 9 per cent, according to *Engineering News-Record's* Cost Index Number—pictures the final slump of the steel market and labor deflation, and was the last important decline to be recorded. Since then cost has been about the same from month to month, even creeping up slightly.

Prices are stiffer, and there is a growing feeling that they may rise generally. Warrant for this feeling may be found in a study of the accompanying chart, in which the *Construction Cost Index* (CC) and the *Construction Volume Index* (CV) are plotted to the same scale. The CV Index shows the rate at which contracts are being awarded, compared with 1913 activity. From June, 1920, to June, 1921, the average monthly rate (70 per cent) was 30 per cent lower than in the year before the war—and 1913 itself was a subnormal construction year. On the other hand the average rate for the last twelve months has been 122 per cent, which is 22 points greater than for 1913 and 74 per cent higher than for the preceding twelve months.

Confidence began to return to the construction industry with the opening of 1921. This is clearly reflected in the jump of the CV Index from 43 to 88. By May the 100 per cent level had been reached, activity being equal to the average 1913 rate. This general level was maintained during the rest of the year. Only minor ups and downs of the curve appear during this period.

The abrupt increase in contracts let in February, 1921, followed by a continuance of this higher volume rate, began to show visible effect in November, 1921—ten months after the first impetus. Construction cost climbed slightly. It settled back during February, 1922, but the rise was resumed in March, and the advance since then has amounted to about 4½ points, or nearly 3 per cent.

It is plain that the second great impetus of the last two years—beginning with 1922—has not yet had anything like its full effect upon prices of construction materials. It is not likely that the experience of the first impetus will be repeated in the second instance, and that ten months will pass before prices react to promised increased demand. There was a reason for this ten-month period in 1921. It would have been a difficult feat to have stemmed the 1920–1921 decline in cost, even if anyone had wanted to do so. Prices had to come down, and only a practically impossible call for materials and labor could have kept them up.


E.N.R. Construction Cost Index number
E.N.R. Construction Volume Index number
Per Cent.
300
200
100
0
JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APRIL MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APRIL MAY JUNE
1920
1921
1922

Therefore, even with the increasing prospective demand for materials, prices and labor rates continued to decline until balanced by actual ordering of materials for the new construction. As stated, this steadying took place beginning November last.

The construction impetus initiated last January by the final price drop is already beginning to stiffen prices and labor rates. Steel and cement are firm. Brick, on the other hand, is jumping upward in a most unhealthy manner. Lumber is rising generally. The average rate paid common construction labor is slightly higher than a month ago.

Obviously, then, construction cost is due for an increase; how much and for how long cannot be predicted. It is easily conceivable that steel—the material hardest hit in the slide from the peak—may return to $1.75 per 100 lbs. for structural shapes. Last fall the feeling was quite general that this would have been a workable price. As there was practically no actual demand for steel at the time, the market continued to weaken until steel could be bought at $1.30. Future prices of cement depend largely upon the coal situation. Adding $2 to the price of a ton of coal at the mines increases the cost of cement 20c. per bbl. Brick prices are already out of reason, but with continued demand and insufficient production there is nothing to prevent still greater inflation.

What will be this increase in construction cost? A guess that would be as good as the next would be five per cent (an Index Number of 175).

CONTRACTORS' OPINIONS OF THE BUILDING OUTLOOK

QUESTIONNAIRES sent to representative firms in the eastern building construction industry brought answers to the Dow Service Daily Building Reports that indicate general satisfaction with the outlook for the remainder of 1922, at least.

One hundred were mailed and ninety replies were received. To the first question: "What, in your opinion, is the principal retardant to a free construction market?" eighty-five named labor as the principal cause. Three attributed it to both labor and high cost of materials, one to shortage of money for commercial building purposes and one to the uncertainty regarding the market's requirements for more building.

To the question: "Is demand below or in excess of production of building materials?" seventy-two replies were to the effect that production is trying to keep pace with demand, which was too spotty under present conditions of the market to warrant general free full capacity production. Nine replied to the effect that the only reason production was not now exceeding demand was because the fuel shortage prevented full capacity production. Three charged that production was being held back to keep prices high in the face of growing demand. Six, on the other hand, believed that there is going to be a reaction in demand, due to advancing prices of commodities resulting in over-production, hence lower prices, and that, therefore, demand would soon fall below present rate of production.

Scarcity of Skilled Labor

The third question: "Do you look for labor liquidation before 1923?" brought an almost unanimous negative reply. Fifty-five replies indicated a belief in a continued scarcity of skilled labor for building construction work this year, but with wage reductions next year. Thirteen looked for continuous shortage of labor and consequent high wages until the ban on immigration is lifted. Eleven expressed the belief that the "snowballing" tactics of certain kinds of building labor was checking building construction progress and would effec-

tually blight it for next year. Three looked for a sharp reduction in wages of general building trades labor this year, two looked for higher wages in 1923 and six expected long labor strikes and lockouts before wages would be permanently lowered to the 1913 scale.

Were it not for the coal shortage there is no doubt that the replies to question No. 4 as to what the industry expected of building material prices would have emphatically prophesied lower prices, because eighty-eight of the ninety replies received were qualified by the remark to the effect that the fuel shortage would have an influence in keeping prices high in 1922. The other two (from brick manufacturers) looked for a lowering of prices before the end of the year.

Registered demand, now fairly measurable for the remainder of 1922, is sufficient to prevent a general building material price slump before the opening of the 1923 building season, according to the bulk of the replies received. Some believed, however, that the peak of building material price ascension had been reached for this year, barring further fuel complications.

Replies to the question as to whether labor was at the present time freely available or scarce brought replies from twenty-nine that available labor was either inefficient or practically out of the market; sixty-one reported plenty of labor. The greatest scarcity is apparently experienced among bricklayers, tile layers, plasterers and in some of the metal trades.

RISING CONSTRUCTION COSTS PREDICTED FOR NEXT SIX MONTHS

MILAN V. AYRES, Statistician of the Associated General Contractors of America in an article appearing in *The American Contractor*, June 3, advises contractors that this is not a time to make low bids. His comments are:

The general level of prices has been going up now for the past two or three months. All authorities agree that the business depression has reached the bottom, and we are now on the up-grade. There is practically no exception to the rule that prices generally increase somewhat during the period following a depression, when business is recovering. We believe that this is now occurring and will continue probably for at least six months to come. The long time tendency of prices will probably be downward, but for some time they are going up.

Wages in many lines have been reduced rather severely during the past few months. Unquestionably, in some places and in some industries, where wages are still at the peak, reductions will be made, but a time of improving business is not a time when wages generally can be reduced. Immigration has been restricted in such fashion as to greatly reduce what has in past years been the principal source of recruits for the ranks of common labor.

Business is improving and freight rates are staying up. The railroads have made only a beginning toward a recovery from a desperate financial plight and they will not willingly submit to drastic reductions.

WHO GETS THE BUILDING MONEY

ONE and one-half billions of dollars were spent in building operations authorized by permits issued in 207 cities of this country in 1920. According to the best available estimates about 44 per cent of this sum, or 660 millions of dollars were paid for materials, slightly less than this, or 657 millions of dollars went as wages to labor, while about 12.2 per cent, or 183 million dollars account for all overhead charges including contractors' profits.

The table herewith shows this distribution in detail. The figures are not presented as embodying a high degree of accuracy. They are based upon data given in three previous INDEX reports, issued on April 8, 1922, February 18, 1922, and October 24, 1921. These show the cost of buildings authorized by the 1920 permits of 207 cities, by classes of construction, the distribution of labor costs among the building trades in wood and brick construction, and the distribution of total building costs among material, labor and overhead. In combining these data certain assumptions had to be made which necessarily makes the final results only approximate.

It is believed, however, the diagram gives a fairly accurate view of how this money was actually expended. It is safe to conclude that a decrease in material costs would have the greatest effect in lowering cost of building, that carpenters' wages are reflected in building costs much more than those of any other class of labor, and that contractors' profits do not constitute an inordinate portion of the total costs.

	Millions of Dollars	Per Cent of Total
MATERIAL	660	44.0
LABOR		
Carpenters	243	16.2
Bricklayers	114	7.6
Common labor	58	3.9
Plasterers	56	3.7
Plumbers	52	3.5
Painters	48	3.2
Hod Carriers	36	2.4
Electricians	17	1.1
All others	33	2.2
OVERHEAD and PROFIT		
Overhead	81	5.4
Compensation of sub-contractors	54	3.6
Compensation of general contractors	48	3.2
	1500	100.0

ALLOCATION OF BUILDING COSTS
Approximate distribution of one and one-half billion dollars expended under building permits issued in 1920 in 207 cities.

Copyright 1922, for INDEX
Associated General Contractors
Washington, D.C.

BUILDING TRADES LABOR SHOWS GAINS IN SOME CITIES AND NO DECREASES

STATISTICS on building trades wages compiled to June 1 are presented in *Engineering News-Record* from which the accompanying table is reprinted. Steady and sustained gains in employment throughout the United States are shown in reports of the President's Conference on Unemployment. For every 100 jobs listed during April there were 150 applicants as against 182 in March, 205 in February and 226 in January. This represents a decrease of 33 per cent in the number of applicants for employment during the first four months of the year. Unemployment has decreased about 61 per cent since May 1, 1921, according to the National Industrial Conference Board.

Actual increases in rates are making their appearance in building trades wage schedules, due no doubt to increasing

(Higher rates indicated by +, decreases by −)

Cities	Bricklayers	Carpenters	Hoisting Engineers	Hod Carriers	Structural Iron Workers	Common Labor
Atlanta	$0.90	$0.70	$0.70	$0.30	$0.65	$0.20
Baltimore	1.25	.80	.87	.54	1.00	.30
Birmingham	1.00	.75	.50@1.00	.15@.25	1.00	.15@.20
Boston	.90	.90	.90	.60	.90	.55
Chicago	1.10	1.00	1.10	.....	1.05	.72½
Cincinnati	1.25	.95	.95	.72½	.95	.40
Cleveland	+1.25	+1.04@1.10	1.04	.60	+1.10	.57½
Dallas	1.00	1.00	1.00	.60	1.00	.25
Denver	1.25	1.00	1.00	.75@.81¼	1.03⅛	.35@.50
Detroit	+1.12½	.80	.80@.90	.50@.60	.60@.80	.50
Kansas City	1.07½	1.00	1.00	.80	1.07½	.....
Los Angeles	1.25	1.00	1.00	1.12½	1.00	.56¼@.62½
Minneapolis	1.00	.80	.80	.65	.80	−.35@.50
Montreal	.80	.60	.50	.35	.55	.20@.30
New Orleans	1.00	.88	.90	.40	1.00	.30
New York	1.25	1.12½	1.25	.87½	1.12½	−.44@.60
Pittsburgh	1.30	1.12½	1.00	.80	1.00	.35@.60
St. Louis	1.25	1.12½	1.12½	.85	1.05	.35@.40
San Francisco	1.12½	1.00	1.00	.75	1.12½	.47½@.50
Seattle	1.00	.80	.90	.70	.80@.90	.50@.60
Philadelphia	1.00	.90	.90	.75@.90	.90	.25@.35

shortage of skilled mechanics. For example, carpenters in Pittsburgh and bricklayers in Detroit have been granted an increase of 12½c. per hr., effective June 1. No wage decreases for skilled labor are noted in twenty-one cities reporting to *Engineering News-Record*, though slight reductions and adjustments are reported for common labor in New York and Minneapolis.

With the 1921 wage scale still in effect in New York City and premium wages being offered many of the skilled building trades, the unskilled rates seem to range between 44c. and 60c. per hr., which is considerably below the 1921 schedule. This is plainly an instance of cutting under the established rate for union common labor and applies to conditions such as those existing in reinforced concrete construction.

FIVE-YEAR RISE AND FALL IN HOTEL OPERATING COSTS

AN interesting tabulation of hotel room operating costs was recently published in *The Stevens Monthly*. This should be of interest to architects who design hotels as it gives various details of hotel operating costs, together with a value comparison of the fluctuation of such costs during the last five years.

Although the United States entered the European War in April, 1917, it was not until a year later that the increased cost of labor and supplies seriously affected the operating cost of hotel rooms. Hotel operating costs increased very rapidly during the year 1919, reached their peak in 1920 and declined somewhat in 1921, and many of the items are nearly back to normal at the present time. The accompanying table shows detailed operating expenses of one hotel for the past five years, and for the first three months of this year. This hotel, operating in one of the larger American cities, under normal conditions is believed to be a fair example of the average, modern, fireproof hotel, every room with bath.

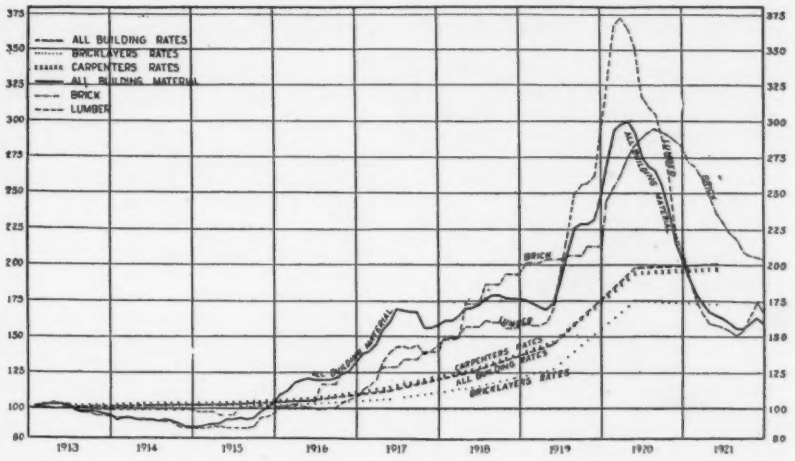
It can be seen, by referring to the table, that the hotel is now paying a rental twenty per cent (20%) higher than it did in 1917, yet the actual rental paid to the landlord is exactly the same as it was then, the higher rental shown at the present time being chargeable almost entirely to increased taxes. As most hotels are rented on a basis of a fixed sum, plus taxes and insurance, it can be seen that the rental chargeable against hotel rooms is bound to show a material increase over pre-war rentals as long as taxes remain high, and nobody hopes for any material reduction in taxes in the near future. As a matter of fact, in many cities the tax rate for the year 1922 will be the highest ever known.

Light, heat and power can hardly return to pre-war prices until coal is reduced to a pre-war price and that is out of the question as long as freight rates are as high as they are, and the cost of coal in most cities is very largely a question of freight. In the table attached, the item for heat for the first three months in 1922 is unusually high, because the

(*Continued on page 64*)

REFERENCE DATA ON BUILDING COSTS SINCE 1913

IN the course of discussion with clients, architects often find reason to refer to the cost of building materials and labor at various periods since 1913. In estimating costs it is also of value to have market data which may be applied for purposes of comparison to the known cost of any building built since 1913. The following tabulation and chart presents in an interesting manner the trends of building material costs and labor costs since 1913. It was prepared by the Bureau of Labor statistics of the U. S. Department of Labor.



ANNUAL INDEX NUMBERS OF BUILDING MATERIAL PRICES AND OF UNION WAGE RATES PER HOUR IN MAY, 1913, TO 1921

Building Material, Average 1913 = 100
Union Wage Rates, May, 1913 = 100

Year	All Building Materials	Lumber	Brick Common	All Building Trades Combined (May)	Bricklayers (May)	Carpenters (May)
1913						
Lowest	96	95	99			
Highest	103	104	101			
Average	100	100	100	100	100	100
1914						
Lowest	88	87	99			
Highest	94	94	99			
Average	92	92	99	102	102	102
1915						
Lowest	88	87	96			
Highest	104	97	102			
Average	94	89	99	103	103	103
1916						
Lowest	110	99	101			
Highest	132	108	125			
Average	120	102	108	106	104	106
1917						
Lowest	138	113	125			
Highest	169	144	139			
Average	157	135	132	113	107	115
1918						
Lowest	161	148	149			
Highest	179	161	194			
Average	172	155	176	126	115	126
1919						
Lowest	169	158	202			
Highest	248	292	213			
Average	201	210	206	145	128	146
1920						
Lowest	204	209	245			
Highest	300	373	295			
Average	264	307	279	198	175	195
1921						
Lowest	156	151	204			
Highest	192	194	272			
Average	165	163	232	201	173	198
1922						
January	157	166	204			
February	156	165	202			
March	155	164	200			

heat is bought from an outside plant, and is metered into the building, and, consequently, the rate would be high for the winter months and low for the summer months, but the average for the entire year of 1922 should not exceed that of the previous year.

No depreciation is shown in the unit cost for the first three months of 1922, for the reason that this hotel has charged off nearly its entire equipment during the first five years. Therefore, it is not setting up a depreciation charge this year.

It will be noticed that there is no charge, either in 1921 or 1922, for feeding employes, for the reason that in this hotel none of the employes outside of the restaurant and kitchen help is given any meals or any allowances other than his salary.

Maintenance in a hotel is a variable item and the charge in any one year depends very largely upon how much the operator feels like spending for the year in renewing his house. In the years immediately following the war, maintenance was very expensive, due to high prices of both material and labor and any operator that expended an appreciable amount for maintenance in the years 1919 and 1920 materially increased his room operating expenses. It can be seen by referring to the table, that for the hotel in question the reduction in room costs for 1921 over the year 1920 is almost entirely accounted for in the saving of payroll and maintenance expenses. Likewise the lower expenses so far in 1922 over the year 1921 are almost entirely accounted for by the further saving in payroll and the omission of depreciation charge.

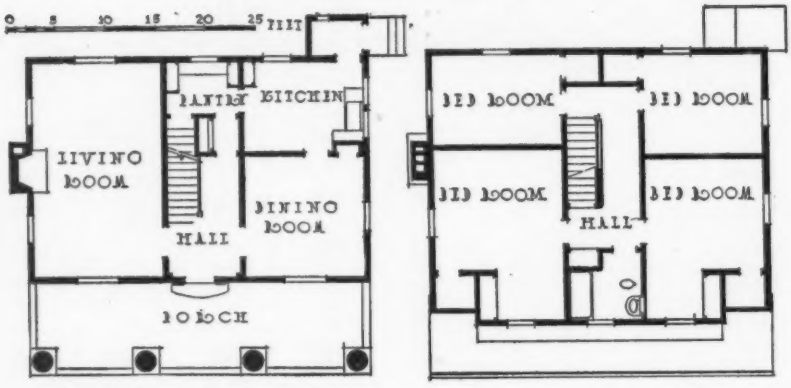
It is not probable that this hotel can operate these rooms in the future at a much lower rate than it is doing at the present time. In other words, without allowing anything for depreciation or vacancies, this hotel must assume a room operating expense of approximately two dollars per day. If this hotel had a minimum rate of two dollars and fifty cents per day for a room with bath, and could average only 80 per cent full, it would just break even on its rooms at two dollars and fifty cents per day, and must depend for its profit on the rooms renting for more than two dollars and fifty cents per day, and the problem that this hotel operator faces if he would make any money, is to rent all his rooms at an average price considerably above two dollars and fifty cents per day to keep all of his rooms more than 80 per cent full throughout the year.

HOTEL HARDING
(Name is fictitious)

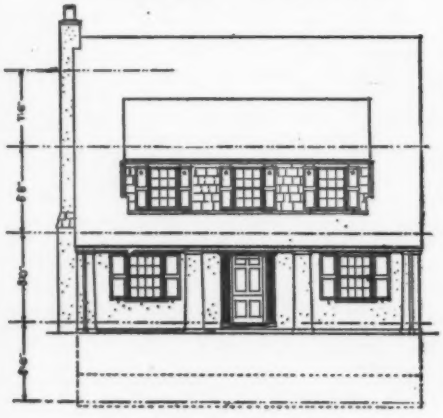
	1917	1918	1919	1920	1921	First 3 Months 1922
Payroll	.200	.194	.239	.358	.349	.278
Rent	.670	.697	.760	.810	.806	.809
Light and Power	.018	.022	.019	.027	.027	.040
Heat	.033	.026	.027	.039	.050	.114
Hot and Cold Water	.041	.043	.040	.051	.065	.044
Printing and Stationery	.014	.009	.015	.020	.015	.006
Laundry	.088	.102	.183	.078	.065	.060
Advertising	.036	.030	.033	.029	.019	.007
Telephones	.014	.014	.014	.015	.014	.014
Maintenance	.101	.174	.354	.465	.260	.253
Depreciation	.170	.163	.164	.117	.107	....
Linen Renewals	.060	.024	.037	.048	.028	....
Miscellaneous	.015	.004	.004	.002	.001	.063
Feeding Employes	.016	.020	.036	.014	....	....
Administration	.194	.164	.207	.234	.160	.219
Housekeeping	.216	.243	.266	.329	.232	.127
	1.886	1.929	2.398	2.636	2.198	2.034

COMPARISON OF DETAILED OPERATING COSTS, SINCE 1917, OF A HOTEL ROOM WITH BATH

Estimates on Typical Small House Show Increases



Floor Plans and Elevation of Typical House on Which Estimates Are Based

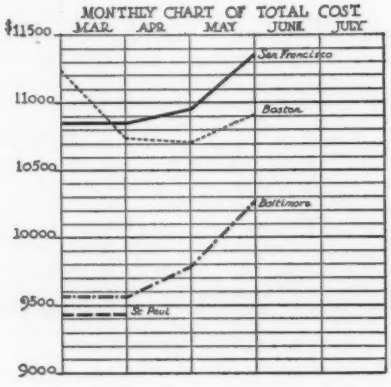


WE have submitted working drawings of this house, together with a quantity survey of materials, to a representative contractor in each of the cities named, and have secured bona fide estimates which are tabulated below. Specifications are in accord with good practice in the several localities as found in houses of this size built under the supervision of architects. The figures are for the cost complete, including contractor's overhead and 10 per cent profit, but excluding architect's fee.

The cubage of the building is figured from the first floor area exclusive of porches and a height measured from 6 ins. below cellar floor to half point of gable, to which is added cubage of kitchen entry and half the cubage of porch, taking height from footings to plate of dormer.

COST OF HOUSE (Cubage, 27,150 ft.)

	Apr.	May	June
Baltimore	9569.21	9785.21	10272.50
Cu. Ft.	.352	.36	.378
Boston	10729.65	10712.64	10906.50
Cu. Ft.	.395	.394	.401
San Francisco	10849.63	10949.63	11347.00
Cu. Ft.	.399	.406	.417
St. Paul	9430.00		
Cu. Ft.	.347		



BOOK DEPARTMENT

SCHOOL ARCHITECTURE; PRINCIPLES AND PRACTICES. By John J. Donovan and others. 724 pp., 9 x 12 ins. Price $20. The Macmillan Co., New York.

NO change in the institutions of modern life has been more complete than that which during the past few years has been wrought in educational methods. Alterations in the school curriculum and the addition of studies not dreamed of in the days when the education of young Americans was conducted in the "little red schoolhouse" have been followed by other changes even more sweeping which, particularly in some parts of the west, involve much of what is generally called "community work." All this development in the scope of the school has logically had its due effect upon the planning of the building itself to fit it for fulfilling its present-day function. New and constantly advancing ideals have led to the publication of a number of excellent works upon the modern school building, its design, plan, construction and administration, but there has long existed the need of a work sufficiently broad in scope to sum up and properly present the modern schoolhouse, ideal as to plan and equipment and complete and efficient in the correlation of its activities. This need has at last been filled, and the present volume is the result.

Taunton High School, Taunton, Mass.
Kilham, Hopkins & Greeley, Architects
Illustration from "School Architecture"

It would be difficult indeed to imagine anything more complete than the review of the modern educational plant which Mr. Donovan has provided in these well filled pages. In his 28 chapters he discusses schools of various types—the public school in its different grades, the parochial school and such other schools as those devoted to trade, vocational and other forms of educational work. He covers every detail of the school from "Sites and Grounds," in Chapter I, through other chapters which deal with the school's architecture, planning, construction, cost and the necessary landscape work to sections which are concerned with the school's equipment, organization and administration, school hygiene and physical education; then to special chapters wherein are discussed the kindergarten, the school library, assembly hall and departments of music, physics and chemistry. Later chapters deal with departments of drawing and industrial arts, domestic science department and the school cafeteria. Many of these chapters have been prepared by specialists well qualified to discuss them. As illustrations for this valuable work the author presents the best examples of schools of every type, taken from every section of the country, and the most successful work of many well known architects appears in views of exteriors and interiors, in plans and details. The work of the modern school by no means ends with the work of the classroom or the laboratory; there are still the out-of-door activities to be reckoned with and provided for, and the success of many a school depends in large measure upon the skill with which these departments have been arranged.

War conditions during the past few years have necessitated the curtailment or even the complete abandonment of school building all over the country, but the

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time has now come when projects long dormant are being revived, and other projects will be undertaken as a result of the pressing demand for more and better school accommodations. These new school buildings must be of a high order if they are to equal the expectations of the taxpayers who make them possible, and to architects everywhere who are interested in school planning and who would make their schools as efficient and satisfying as their clients have every right to expect we would commend a careful study of this complete and authoritative work upon the subject.

GOOD HOUSES. By Russell F. Whitehead. 63 pp., 8 x 11 ins. Weyerhaeuser Forest Products, St. Paul.

STUDY of American domestic architecture is to a great extent a study of structures built of wood. Of the styles employed many had been traditionally developed in materials such as stone or brick, but the American builders seized upon the fundamentals of the types and adapted them to the use of frame, and the success of their work is illustrated in countless examples which still exist. These styles not only express American ideals but, as a practical matter, are easy styles in which to design. Their forms are simple and are well suited to methods of construction in use a century ago and in use today. These styles, moreover, are ingrained is us, among all ranks, as thoroughly as any part of American culture, and it is absurd to suppose that 50 years of Victorian ugliness could have broken the tradition. Their spirit remains as vigorous as ever.

The present volume might be regarded as a study into the designing of the frame house, with its designing upon historical lines chiefly in view. The several forms of the "colonial" are considered, the "American Georgian" and the "classic revival," the Italian and Spanish types, and such comparatively late styles as the "Pacific coast bungalow" type, and in most instances the work contains illustrations of excellent examples of old work of each kind together with illustrations of modern houses of these same types, obviously inspired by if not actually based upon the old, and floor plans of the modern examples, the adaptations being designed in excellent taste. Whereas in colonial days people were satisfied to build their homes in the styles prevalent in their localities, the development and growing independence of the individual in America now call for a more diversified expression than was found in any one regional type. But no matter how creative a man may be, he can make his house successful only by acquiring an accurate vocabulary of forms and details of the style that appeals to him, and by entering thoroughly into the spirit of its traditions.

While frankly devoted to the interests of building of wood, the work is of great value to architects and to anyone interested in the general subject of domestic building, and particularly valuable are its chapters on "Selection of a Style," "Planning the House," and "Proper Use of Lumber," which considers its use for interior work as well as for exterior construction. Since the design and plan of the modern houses are such as will readily commend themselves for practical use, the publishers are prepared to furnish plans and working drawings from which they may be built. The title of the work suggests its broad treatment, which covers considerably more than the building of frame residence structures.

"SCHOOL ARCHITECTURE; PRINCIPLES AND PRACTICES"

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The Complete Book of the School and Its Equipment

COVERS every point, from the survey of the building site to the final detail of school furnishing and administration. The authors first analyze the purpose and organization of the American school in its different phases, and this analysis serves as a basis for the development of its architecture. Thus the application of modern school architecture as a direct expression of modern school development and its broadening service to the public is concisely and logically shown. This volume constitutes the last word thus far on this vitally important subject. An invaluable work to architects interested in school planning and construction.

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